INTERRACIAL MARRIAGE IN THE U.S. IN 2006

A Dissertation

by

HEATHER TERRELL KINCANNON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2009

Major Subject: Sociology

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ABSTRACT

Interracial Marriage in the U.S. in 2006. (May 2009)

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Rates of black-white intermarriage in the United States have increased over the last sixty years, yet they remain at levels below other types of interracial/interethnic unions. Prior research has centered largely on individual-level factors associated with the formation of such unions, culminating in three not entirely consistent micro-level theories: status-caste exchange, status homogamy, and educational/economic success. Most of this literature does not consider contextual-level characteristics, which I argue should have an independent effect on the incidence of these unions. My dissertation explores these issues with microlevel and multilevel models using data from the 2006 American Community Survey. I examine both micro and macro level predictors of the odds of white women marrying black men, and black women marrying white men in the metropolitan areas of the U.S. in 2006.

In my level one analyses, six logistic regression equations are estimated to test the efficacy of the abovementioned microlevel theories of interracial marriage for black and white women. Status-caste exchange theory is accorded no support from my investigation, and status homogamy theory receives inconsistent support for white

women. The results clearly convey that educational/economic success theory is applicable for predicting intermarriage among white and black metropolitan women in the United States. Among white women, those with high occupational status and high annual income are more likely to be intermarried than those with low occupational status and lower income. Among black metropolitan women, those with high occupational status and high levels of education are more likely to be intermarried than those with low occupational status and low levels of education.

In my multilevel analyses, four hierarchical generalized linear models are estimated to evaluate the likelihood of intermarriage for white and black women living in metropolitan areas in the United States. My results show that context matters in predicting and understanding intermarriage for both groups of women. Both the individual-level characteristics of the women, as well as the contextual-level characteristics of their metropolitan areas, were shown in my equations to impact their likelihood of being intermarried. Future research would benefit from the inclusion of social context in any consideration of intermarriage, particularly through the use of multilevel modeling, which until now, has not been utilized by researchers in this area.

To Marshall and Vance,

for supplying me with love and laughter.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

This dissertation will focus on the dynamics of interracial marriage in the

metropolitan areas of the U.S. in 2006. I will examine both micro level and macro level

predictors of the odds of white women marrying black men, and black women marrying

white men. The reader might inquire why I am interested in this topic. I will first

discuss my personal interest in undertaking this study. Later I will justify this inquiry

with respect to sociological and demographic issues.

Strangely enough, interracial relationships became of interest to me after a single

experience in my youth. After completing my undergraduate degree in 2001, I became

friends with an African American man named Neal. One Friday evening we ate dinner

together at the local diner, and my perspective on race relations was forever changed.

As we entered the crowded restaurant, I immediately felt the stares of the other patrons.

Being a white female in a white town, I had never experienced such an unwelcoming

and hostile feeling from strangers. I thought once we were seated, their silent

indignation would subside, but I was wrong. The waitress soon approached us with a

message from a group of white men sitting at the bar across the restaurant. They told her

to tell my friend that he had left the tags on his new pair of jeans. Obviously

embarrassed and now very self-conscious, Neal ripped the tags off, thanked the waitress

and halfheartedly laughed at his blunder, while the laughing men looked on from the bar.

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This dissertation follows the style of *Population and Development Review*.

If Neal had been white, or if I had been black, it is unlikely that anyone would have noticed the tags, and if they had, no message would have been sent. This may seem like a minor incident to initiate such reflection, but the chill of the room was strikingly new and foreign to me. I was confronted for the first time with racism in my own back yard. This single event has inspired me to learn more about the people who dare to defy it. I turn now to a broader justification for my proposed study.

Historical Background of Interracial Relationships

Romantic relationships between blacks and whites are not new, and likely transpired before blacks were taken to North America as slaves (Smith 1966; cited by Foeman and Nance 1999). Black-white intermixing took a wretched turn in this country, however, with the onset of slavery and the associated racial ideology in the mid-to late-1700s (see Feagin 2006). Feagin (2006:15) reports that "under the gendered racial oppression that was slavery and legal segregation, very large numbers of black women were raped, at will and generally with impunity, by white men in the elite and in the working and middle classes." This coercive practice became so ubiquitous that seventeenth-century colonial laws were passed to thwart such associations between the two races (Feagin 2006; Smith 1966).

As stated by Porterfield (1982:17), "No other mixture touches off such widespread condemnation as black-white mixing" (cited by Foeman and Nance 1999). Many of the founding fathers passionately contested such mixing. Benjamin Franklin claimed that white "amalgamation with the other color produces a degradation to which no lover of his country, no lover of excellence in the human character can innocently

consent" (Takaki 1979:50; cited by Feagin 2006:175). All the while, many of the most outspoken racial purists practiced such miscegenation (Gaines et al. 1999; Morris 2003). Thomas Jefferson, the main author of the Declaration of Independence, "wrote that African people were inherently mentally inferior and physically unattractive and, further, that racial mixing would have disastrous consequences for the United States" (Rosenfeld 2007:33; Ellis 2000). Yet Jefferson himself had an intimate relationship with one of his several hundred slaves, Sally Hemings, which lasted thirty years and resulted in seven children. Political adversaries charged Jefferson with fathering these children, but his denial held in court because of his tremendous power and position in the country (Rosenfeld 2007). Historians maintained Jefferson's innocence for 170 years, until DNA tests in 1998 verified that he was indeed the father of Sally Heming's children (see Neiman 2000). Feagin (2006:15) speculates that "the white focus on and obsession with black Americans historically, and the frequently extreme character of white rationalizations of antiblack oppression, are linked to the fact that white Americans as a group have for centuries oppressed a group of people who are often, in reality, their *unacknowledged kin*."

Although black-white marriages were uncommon throughout our nation's history, considerable effort was exerted to prevent their occurrence (Roediger 2002; Morris 2003). Antimiscegenation laws barred marriage between blacks and whites, which effectively deprived mixed race children of their rightful legitimation and denied blacks access to white power and wealth, irrespective of blood ties (Heer 1966; Foeman and Nance 1999:542). While some of these laws also affected other racial groups, such

as Asians and Native Americans, blacks were the only racial group affected by all the statutes (Weinberger 1966; Foeman and Nance 1999). Antimiscegenation laws existed in forty of the fifty states until 1967, when the landmark *Loving v. Virginia* Supreme Court decision ruled all such statues unconstitutional (Weinberger 1966; Spickard 1989).

Tucker and Mitchell-Kernan (1990:210) recapitulate Porterfield's (1982) findings, stating that "on a national level, the number of black-white marriages rose just after Emancipation, peaked around 1900, then declined until 1940 [and]…Blacks and whites have married each other in ever-increasing numbers since that time." While the number of interracial marriages increased substantially from 157,000 in 1960 to 1,674,000 in 2002, interracial marriage still remains relatively rare (Joyner and Kao 2005). In 2002, interracial unions comprised only 2.9 percent of all marriages in the United States (U.S. Bureau of the Census 1998, 2003a; Joyner and Kao 2005). Additionally, Gaines and colleagues (1999) report that less than one-fourth of all interracial marriages are black-white unions. According to Zhenchao Qian (1997:271), "racial endogamy remains strong…despite increasing number of interracial marriages [and]…Though on the rise, interracial marriage between whites and African Americans is the lowest."

Black men and black women have differed appreciably in their rates of intermarriage over the years, with black men "outmarrying" to a far greater extent than black women (Tucker and Mitchell-Kernan 1990:210). In the 1960s, over 70 percent of black-white unions were comprised of black males and white females (Monahan 1976; cited by Qian 1997:264). Monahan (1971) inspected data from 1916 through 1964 for

New York, and encountered only two years (1919 and 1935) in which the rate of intermarriage was higher for black women than for black men (cited by Tucker and Mitchell-Kernan 1990). Throughout the years, males comprised between 41 and 90 percent of all black interracial marriages. These findings have been confirmed in numerous studies undertaken in other locations (see Merton 1941; Barnett 1963; Burma 1963; Annella 1967; Heer 1974; Porterfield 1982; Kalmijn 1993). A few exclusions, however, are worth mentioning. In the District of Columbia between 1879 and 1943, most black-white unions were comprised of black women and white men (Monahan 1977; cited by Tucker and Mitchell-Kernan 1990). Furthermore, data from the 1960 U.S. Census showed that black female-white male marriages were more common in the South than black male-white female marriages (Heer 1974).

The Changing Family Structure of America

Many early sociologists (Karl Marx, Emile Durkheim, Max Weber, and W.I. Thomas) believed the industrial revolution (1850-1920) was responsible for the most dramatic changes in American family structure and life (Rosenfeld 2007). In terms of demographic phenomena and events, they were correct. Mortality and fertility rates dropped, the divorce rate rose, urbanization increased, and household size decreased significantly. On the other hand, the family life and traditions they assumed were "turned on their head" actually traversed the industrial revolution unharmed (Rosenfeld 2007:43-45). Rosenfeld's (2007:51) innovative analysis of U.S. census household survey data from 1850 to 2000 illustrates "that the internal social structure of the family remained remarkably unchanged through the industrial revolution."

From 1880 to 1940, during the peak of industrialization, roughly 90 percent of young adult women were married or were still living with their parents (Rosenfeld 2007). Only about 12.6 percent of women were single and living alone during this time period. Yet in 2000, 39 percent of American women in their twenties were single and living independently (Rosenfeld 2007). Changes in the living arrangements of young adult men were comparable. This remarkable shift in family structure began not during the industrial revolution, but during the early 1960s. According to Rosenfeld (2007:55), "the rise of residential and geographic independence among young adults in the United States is a result of the decreasing tendency of single adults to live with parents, and the well known post-baby boom trends of increasing age at marriage and increasing rates of divorce" (see also Cherlin 1992; DaVanzo and Rahman 1993). He refers to this period as the independent life stage.

Rosenfeld's (2007) findings call into question the widely held belief that young adults are swarming back into their parents' homes after college—a fictional trend the press has labeled the "boomerang effect." In truth, young adult Americans tend to be more independent today than they have ever been before. The majority of them leave home directly after high school to attend college and many are able to support themselves financially at a reasonably young age. Since parental control is contingent on co-residence with children, parental control is at an all time low. Where parents of the 1940s and 1950s were able to monitor the social outlets and activities of their young adult children until marriage, parents today usually relinquish this type of control when

their children leave for college. The new freedom of young adults "has contributed to a quiet revolution in the nature of family life" (Rosenfeld 2007:185).

Since 1960, there has been an increase in every type of nontraditional union. The numbers of interracial, same-sex, and heterosexual cohabiting couples grew in conjunction with the dawn of the independent life stage and have been increasing steadily ever since (Rosenfeld 2007). The number of black-white intermarriages was under 50,000 for most of the twentieth century, but in the 1970s started to increase and in 2000, there were 345,000 black-white unions. Other alternative relationships saw even greater proliferation. As Rosenfeld (2007:77) explains, "Social stigmas, parental pressure, and the law kept the number of visibly transgressive unions very low before 1960, and the low numbers reinforced the stigma against actual or would-be transgressors by isolating them." The social movements, decline of parental influence, and changing social and sexual attitudes since 1960, have resulted in an increasing acceptance of both interracial and same-sex marriages. As such unions become less uncommon, their increased visibility serves to promote more of the same.

In the past, few people had personal connections with someone in an alternative union because its occurrence was so rare. Today, "same-sex cohabiting couples touch approximately 10 percent of Americans at any one time" and "black-white couples touch approximately 8 percent (Rosenfeld 2007:82)." Rosenfeld (2007:83) emphasizes "that the steepest change in social exposure to new or transgressive family forms occurs when the new family form is first beginning to emerge in the society." During this time, condemnatory response to the new family form is at its peak. Once the alternative form

becomes more visible and familiar to people, tolerance and acceptance of the new form become possible and even probable.

The path of heterosexual cohabitation is an excellent example of this exposure and acceptance process. Cohabitation rates for unmarried women grew from 3 percent in 1978 to 9 percent in 1998 (Casper and Cohen 2000) and at present, over half of the female population cohabits with a man prior to marriage (Bumpass and Lu 2000; see also Knap and McLanahan n.d.). Pre-1960, cohabitation was frowned upon as an act of indecency. Now that this living arrangement has become commonplace, it is widely regarded as a standard living preference well within societal norms.

Tolerance for homosexuality has also increased in the post-1960 world (Rosenfeld 2007). As with interracial marriage, younger Americans are increasingly accepting of same-sex partnership. Rosenfeld explains that the family's diminishing influence during their children's independent life stage is creating an increasing opportunity for such acceptance. Further, as each new generation comes of age it replaces an older generation who came of age in the society before 1960. Because there will no longer be any pre-1960 thinking Americans alive by the year 2050, Rosenfeld predicts that homosexuals will by then have achieved all the legal rights that are presently reserved for heterosexuals.

Prior to World War II, only the nation's most affluent citizens had the resources necessary to obtain a college education (Rosenfeld 2007). Today, college is an option for most of Middle America and one that most young adults seize. When the youth move out of their parental nests to attend college, often in metropolitan areas, they are at

a much greater statistical risk of participating in an interracial or a same-sex union. As Rosenfeld notes (2007:188), "the geographic mobility and economic freedom of the independent life stage has a powerful and demonstrable effect on the kinds of unions young people form." At one time, parents had considerable influence over the marriage choices of their children, with law and tradition bolstering this influence. Since the emergence of the independent life stage in the 1960s, parents have had a diminishing amount of control over whom their children date and marry, resulting in the growth of alternative unions.

Racism and Interracial Contact (Contact Hypothesis)

"Today, as in the past, the people of the United States live under a banner of liberty and justice that is only a hypothetical ethic not well realized in practice" (Feagin 2006:293). While there has been some progress for African Americans in terms of educational and economic achievement, there are still major racial disparities (Yancey 2007). Although there has been a large decline in the extent of overt racism and hostility aimed at African Americans, these evils are far from eradication. Racial antipathy continues to infect daily interactions in America (Yancey 2007); residential segregation remains widespread (Jakubs 1986; O'Hare and Usdansky 1992; Farley and Frey 1994; Massey and Denton 1993) and "important political divisions in society are still shaped by racial hostility" (Sniderman and Tetlock 1986; Kinder and Sanders 1996; Sidanius et al. 1996; Yancey 2007).

Previous research indicates that individuals of different races have dissimilar understandings about racial matters and racism (Jaynes and Williams 1989; Kluegel

1990; Hacker 1992; Schuman et al. 1997; Weakliem 1997; Yancey 2007). Many studies have shown that members of the white racial group are prone to be somewhat naïve when it comes to racism and related issues, while people of color are keenly aware of these matters (Sniderman and Piazza 1993; Dalton 2002; Yancey 2007). As Yancey (2007:16) points out, "people of color understand the problems of racism on a more personal level, and this understanding shapes their racial attitudes in ways that escape majority group members." Many current theories in the area of race, such as color-blind racism (Carr 1997; Lewis et al. 2000; Bonilla-Silva 2003) and symbolic racism (McConahay and Hough 1976; Kinder and Sears 1981; Sears 1988; Sniderman and Piazza 1993), focus on the subtle quality of modern-day racism that gives white Americans the license to ignore the racial disparities and hostilities surrounding them (Yancey 2007). Several scholars contend that white Americans have a "white racial identity" which helps them process their surroundings and justify the nation's existing racial hierarchy (Roediger 1991; Giroux 1997; Hartigan 1999; see also Yancey 2007).

According to Yancey (2007:17), three main elements are said to comprise the white racial identity (Yancey 2007): color blindness (Blauner 1989; Dyer 1997; Dalton 2002; Wildman and Davis 2002), individualism (Kluegel 1990; Virtanen and Huddy 1998) and European cultural normalcy. Color blindness is based on the notion that all people are equal and that racism no longer exists. In adopting this notion, white Americans knowingly or unknowingly ignore the structural dynamics creating racial inequality and suffering in our society (Yancey 2007). "Under the philosophy of color blindness, majority group members can assert that the racially based economic

inequalities that a person of color suffers reflect that individual's inability to succeed"

(Yancey 2007:17).

Individualism is the viewpoint that our successes or failures arise from our own

actions (Yancey 2007). According to this philosophy, individuals who are impoverished

have themselves to blame for their lack of financial security since they did not work hard

enough to achieve it. Given that white Americans tend to have more educational and

economic status than black Americans, "individualism implies that majority group

members have worked harder at achieving success" (Yancey 2007:18).

The third component of the white racial identity is European cultural normalcy.

This refers to the tendency of whites to attach racial inequalities to specific aspects of

black culture, while venerating their own majority group culture (Yancey 2007). In this

way, whites are not admonishing blacks for being "racially inferior," but rather

attributing hardships in the black community to their cultural faults, such as weak family

structure or criminal behavior (see Moynihan 1965; Glazer 1975). These three features

of white racial identity—color blindness, individualism, and European cultural

normalcy—"help majority group members to perceive the current racial hierarchy as a

fair social system" (Yancey 2007:18).

Given the current subtleties of racism today and the ignorance that accompanies

the white racial identity, some believe interracial contact is required to enlighten

majority group members about racism and racial groups (Hewstone 1986; Yancey 2007;

Sniderman and Piazza 1993; Dalton 2002). In the past, whites began to support the civil

rights legislation after they witnessed the brutality of Jim Crow on national television.

Drawing on the contact hypothesis, Yancey (2007) and many others (Allport 1954;

Aberbach and Walker 1973; Ellison and Powers 1994; Meer and Freedman 1966;

Schuman and Hatchett 1974; Robinson 1980; Sigelman and Welch 1993; Williams

1964) argue that interracial contact can provide a similar wake-up call for majority group

members today. Contact theory is based on the simple notion that increased contact

between members from different racial groups will improve racial attitudes (Allport

1954). According to the theory, "if we have regular interaction with members of

different races, then we will reject falsehoods about those groups and come to possess

more compassion for those groups" (Yancey 2007:2). In order for interracial contact to

result in constructive change, four conditions must be met (Barnard and Been 1988):

"(1) individuals from different groups should have equal status with each other; (2)

cooperation, rather than competition, should characterize the relationship between the

groups; (3) the relationships should be intimate rather than superficial; and (4) the

contact should be sanctioned by relevant authority figures" (Yancey 2007:25).

One could argue that interracial marriage and its dynamics closely approximate

all four of these conditions. In general, marital partners are the relevant authority figures

in a family, and they share an intimate relationship that is based on cooperation.

Although husbands still tend to possess more power than their wives, marriages have

become increasingly egalitarian. Some studies have explored the connection between

racial attitudes and partners in interracial unions. Rosenblatt, Karis, and Powell (1995)

discovered that whites who are married to blacks "incorporate a new racial awareness

into their identity" (Yancey 2007:34). Similarly, Luke (1994) and Karis (2003) found

that intermarried white women alter their racial identities, which may transform their opinions on racial matters. Yancey (2007) conducted a mixed method analysis of interracial contact to explore the validity of contact theory in different situations. In his study, whites attributed their progressive racial positions to their marriages with people of color. He showed that "whites alter their attitudes because of what they hear about racism from their spouses, their changing racial position in society, and their witness of racism" (Yancey 2007:89). Bringing mixed-race children into the world also creates profound change in the racial outlook of majority group members.

Most sociologists have concentrated on macro-level solutions for racism and associated disparities (Omi and Winant 1994; Free 1996; Hacker 1992; Oliver and Shapiro 1995; Massey and Denton 1993; Carr 1997; Feagin 2000; Bonilla-Silva 2001; Walker et al. 2003). But micro-level concerns may also be an important part of the puzzle (Yancey 2007). Studies show that institutional programs, such as affirmative action, are losing the support of white Americans (Schuman et al. 1997). Without the micro-level support of individuals, such macro-level attempts to eradicate racial injustice are futile. As interracial marriages continue to touch greater numbers of the majority population, they may become an important vehicle for long awaited change. Indeed, Yancey (2007:116) believes "that interracial contact can produce in majority group members an appreciation for the need for racial social justice." Rosenfeld's (2007) research demonstrates that interracial marriages need not impact every person for significant change to take place. Just as America's laws, traditions, and social structures have inhibited interracial marriages in the past, the increasing number of such marriages

will arguably help re-shape American society in the future. In short, the old saying that, "Demography is destiny," continues to carry water.

My Analysis

While rates of black-white intermarriage have increased over the last sixty years, they remain at levels below other types of interracial unions. Many sociological studies have focused on the dynamics that influence the occurrence of black-white interracial marriage. Most of this research has been conducted at the individual-level of analysis. The independent variables examined have not included contextual-level characteristics, which I would argue, should also have an effect on the incidence of these unions. My dissertation will explore these issues with multilevel modeling. I will test the prominent individual-level theories of intermarriage, along with several contextual-level hypotheses. At present, this type of analysis has not yet been undertaken. I will do so using data from the 2006 American Community Survey.

CHAPTER II

LITERATURE REVIEW

In this chapter, I present a detailed review of the four principal micro-level theories of interracial marriage, namely, status-caste exchange theory, status homogamy theory, structural assimilation theory, and isolation theory. Each of these theories attempts to account for the effects of various individual-level socioeconomic factors on the likelihood of participating in an interracial marriage. Following this review, I present a discussion of several macro-level theories and relevant contextual factors.

Status-Caste Exchange Theory

Exchange theories have been applied frequently in studies of interracial marriage. The basic argument is that black-white marriages are an exchange of high class (or economic) status on the part of black men for high caste status on the part of white women (Van den Berghe 1960; see also Merton 1941). Many analyses in the early to mid-twentieth century supported an exchange perspective, mainly because most white brides were found to be of lower class, while black husbands tended to be of upper-and middle-class status (Van den Berghe 1960; see also Risdon 1954; Reuter 1931; Wirth and Goldhamer 1944; Drake and Cayton 1993; Barron 1946). According to Schoen and Wooldredge (1989:466), "the most fully articulated examples of how such an exchange perspective can be applied to the characteristics of those marrying are found in the classic studies of Kingsley Davis (1941) and Robert Merton (1941)."

Merton (1941) focused on the gender disparities in black-white marriage rates to cultivate his theory of interracial marriage and associated processes (Jacobs and Labov

2002). He believed that black male-white female unions were more common because black men could counterbalance their lower racial caste position by achieving a high status occupation; such economic compensation would thus improve their marriageability to white women (Merton 1941; Jacobs and Labov 2002). In Merton's era, racism prevented most black men from realizing this kind of upward financial mobility. Still it was even more difficult for black women, who were extremely restricted in terms of career options. Accordingly, Merton suggested that some black men were able to tender a profitable exchange with white women because of their attractive income and profession, while very few black women would have the resources necessary to induce such an exchange (Jacobs and Labov 2002). In this way, "marrying up" was a more viable option for black men than it was for black women (Merton 1941; Davis 1941; Jacobs and Labov 2002). In spite of significant advancements in race relations and women's status from the time when Merton developed his theory, black men continue to surpass black women in their rates of out-marriage (Heer 1974; Monahan 1976; Porterfield 1978; Spickard 1989; Tucker and Mitchell-Kernan 1990; Roberts 1994; Heaton and Albrecht 1996; Jacobs and Labov 2002).

Nearly seventy years have passed since Merton presented his status exchange theory, yet it continues to be a popular subject of contention among scholars of interracial marriage (Kalmijn 1998; Jacobs and Labov 2002). Macro studies of hypergamy[1], such as those by Rubin (1968) and Glenn, Ross, and Tully (1974), did not

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[1] According to Merton (1941) and Davis (1941), hypergamy is women "marrying up" in caste, while hypogamy is men "marrying up" in caste, "so black-white intermarriage would either be hypergamy or hypogamy depending on whether the wife or husband was black" (Rosenfeld 2005:1290).

find a recurrent pattern of women marrying men of higher social status than their own (cited by Schoen and Wooldredge 1989). Monahan (1970a, 1970b, 1971, 1976, 1977), who studied black-white unions for many years, doubts the validity of exchange theory (Foeman and Nance 1999). While he found that most husbands in mixed marriages were black, he discovered that the occupational positions of the spouses tended to be evenly balanced (Monahan 1976; cited by Schoen and Wooldredge 1989:466). Additionally, when there was an economic imbalance, it was generally the white female who had higher socioeconomic status. DiMaggio and Mohr (1985) also challenged the exchange perspective, asserting that for both sexes, cultural likeness tends to take precedence over an exchange of "goods."

While many studies oppose exchange theory, others support the notion that people barter traits when selecting a spouse. In their examination of marriage patterns in North Carolina and Virginia, 1961-71 and 1979-81, Schoen and Wooldredge (1989:478) found support for an exchange perspective. When there were deviations from homogamy,[2] marriages tended to reflect "the female's greater emphasis on the male's economic status, the male's greater emphasis on the female's social status, or both" (Schoen and Wooldredge 1989:478). Black-white marriages generally consisted of a black husband and a white wife, and their models showed "a significant interaction between a black male's higher educational status and a nonblack female's racial status" (Schoen and Wooldredge 1989:478). Using log-linear models, Kalmijn (1993) garnered support for the Davis-Merton hypothesis as well. In interracial marriages "in which the

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[2] Homogamy is "marriage between persons with similar characteristics" (Schoen and Wooldredge 1989:465).

man is black there is a persistent tendency for the white woman to marry up more often

than expected" (Kalmijn 1993:139). For marriages in which the husband is white and

the wife is black he found the "reverse pattern: there it is the men that marry up more

often [than expected]" (Kalmijn 1993:138). Qian's (1997) study, which also employed

log-linear models to explore interracial marriage among several racial and ethnic groups,

also showed support for the status-exchange theory among interracial spouses who had

different levels of education.

Status/Educational Homogamy Theory

While status-caste exchange theory proposes that black spouses will have higher

socioeconomic status and/or educational attainment than their white companions, status

homogamy theory proposes that interracial spouses will have comparable levels of SES

(Rosenfeld 2005:1291; Kalmijn 1991a, 1991b). Previous analyses conducted throughout

the 20th century have supported status homogamy theory (Wirth and Goldhamer 1944;

Bernard 1966; Heer 1974; Gadberry and Dodder 1993; Liang and Ito 1999). However,

the theory has been largely marginalized on account of the methodological simplicity of

the supporting research[3] (see Rosenfeld 2005).

According to Rosenfeld (2005), status homogamy is sometimes mistaken as a

situation of status-caste exchange on account of the disparate levels of SES among black

and white Americans. Since whites have generally had an economic and educational

advantage over blacks in the United States, "the SES of interracial couples whose

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[3] For the most part, the status homogamy literature has relied upon simple tabular analyses to substantiate
its claims, while the status-caste exchange literature has used complex statistical models. As Rosenfeld
points out (2005:1287), these differences "are difficult to reconcile."

spouses have identical status appears different from the perspective of the two groups"
(Rosenfeld 2005:1293). Specifically, "the same objective level of SES may appear to be
'low status' when compared to other whites, but 'high status' when compared to other
blacks" (Rosenfeld 2005:1293). Because of the social distance between these two racial
groups, it is common that neither the black nor the white community has complete
information about both spouses. Thus, the white community is left with the impression
that a low status white woman married out, and the black community is left with the
impression that a high status black man married out. Rosenfeld (2005) believes the gap
between objective and relative status has likely contributed to the inconsistent findings
of interracial scholars[4] (see Drake and Cayton 1993; Wirth and Goldhamer 1944).

As mentioned by Rosenfeld (2005), the exchange literature is responsible for
some of the most eloquent rationalizations of status and educational homogamy (e.g.
Elder 1969; Goode 1951). This perspective maintains that every person searches for the
most affluent spouse with the greatest earning potential. "The desire of every individual
to make the best possible match results in homogamy, as the highest-status man and
woman mate with each other, and the second-highest man and woman mate with each
other, and so on" (Rosenfeld 2005:1294). The individuals most deficient in SES end up
marrying each other simply because no more attractive alternatives remain.

Profit maximization may not be the only reason individuals decide to marry.
Generally, marriage is also a bond of camaraderie and compassion, so people tend to
pursue partners "with whom they have a strong personal affinity" (Rosenfeld 2005:1294;

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[4] According to Rosenfeld (2005), Drake and Cayton (1993) and Wirth and Goldhamer (1944) presented
opposing conclusions, even though they were using the same data.

see also Buston and Emlen 2003). Appropriate to affinity theory, high school dropouts

marry each other because they take pleasure in being with one another, not because all

the college-educated individuals have rejected them. William Goode (1971:21), a

supporter of exchange theories of homogamy, also had an appreciation for affinity

theory: "The talented young assistant professor…may seem attractive to his female

students, but he may appear pretentious, unmanly and boring to a lower-class woman"

(cited by Rosenfeld 2005:1294-5).

Education not only connects and divides people intellectually, it also organizes

them in physical space (Rosenfeld 2005). When young people leave their parent's home

to attend college, they are often grouped with other young people of relatively similar

status and ambition. "Social theorists (Blau 1977; Blau and Schwartz 1984; Feld 1981)

argue that personal and intimate social networks are built around social structures (like

education) which divide and stratify us" (Rosenfeld 2005:1295). College campuses,

departments, and classrooms each engender educational homogamy among young

people the same way that a business or divisional workplace (e.g. fiscal department)

creates status homogamy among a collection of employees.

Among white Americans, it is apparent that men and women care less about

finding a "homemaker" or "bread-winner" spouse; today individuals tend to place "more

emphasis on mutual economic potential, such as education and employment history"

(Qian 1997:264; Oppenheimer 1994). Interracial couples are expected to undergo the

same types of transformations in the mate selection process (Qian 1997). Kalmijn's

(1991a; 1991b) research "has shown that during mate selection, social boundaries

between educational groups become stronger than boundaries between religious groups and between groups with fathers from different occupational classes" (Qian 1997:264). Such findings indicate that educational differences may eventually matter more than racial differences in selecting a spouse, thus suggesting that interracial partners will become educationally homogamous.

Educational/Economic Success: Structural Assimilation Theory and Isolation Theory

Many sociological studies suggest that people with higher educational attainment and/or economic status will be more prone to engage in romantic relationships with persons of another race. Structural assimilation theory maintains that "education and the educational system play key roles in the structural assimilation of groups because they promote universalistic and democratic norms, which tend to break down group barriers" (Gullickson 2006:676; see Condran 1979; Gordon 1964; Greeley and Sheatsley 1971; Hyman and Sheatsley 1964; Hyman and Wright 1979; Kalmijn 1998; Lieberson and Waters 1988; Quinley and Glock 1979; Selznick and Steinberg 1969; Taylor et al. 1978). These assumptions are supported by the finding that more educated persons tend to have greater acceptance of other racial and ethnic groups and are more likely to be social activists for people of color (Schuman et al. 1997; Gullickson 2006).

There are other structural explanations for this relationship. Among the middle and upper classes, there is more residential integration (Massey and Fong 1990; Massey and Denton 1993), which would mean more opportunities for interracial contact. Interracial contact is also more likely for those who attend college, as campuses are generally more diverse than secondary schools (Yancey 2002). Further, people of both

higher socioeconomic status and education are found to have more elaborate social networks.

Where structural assimilation theory anticipates a positive association between education and intermarriage for blacks and whites, isolation theory anticipates this relationship only for blacks and assumes no association, positive or negative, for whites (Gullickson 2006). According to Wilson (1978, 1987) and Kalmijn (1993), the changes in America's racialized system since the years of the Civil Rights era have created a division in the life chances of blacks. Middle- and upper-class blacks now have partial access to opportunities once reserved for the majority group, "while lower-class blacks have been further isolated, creating a hyperstigmatized urban underclass" (Gullickson 2006:676). Especially problematic has been the residential mobility of middle-class blacks, which expedites the decline of inner-city areas that remain home to lower-class blacks. As Gullickson (2006:676) explains, "the isolation of lower-class blacks may seriously affect their marriage opportunities with whites through both their lack of propinquity and their marriageability as perceived by whites." Thus, isolation theory assumes that blacks with greater levels of educational attainment will have greater access to the interracial marriage market. The findings of Alba, Logan, and Stults (2000) support the assumptions of isolation theory. They conducted a study using the isolation index ($P*_{xy}$) and showed that as the education and income levels of blacks rise, their isolation declined, and their probability of meeting a member of the majority group increased.

Still, there is little agreement in the literature on how socioeconomic status affects the likelihood of being in an interracial marriage. Some studies indicate that interracial couples tend to have lower SES than endogamous couples, while others suggest the opposite. Using 1960 Census data, Carter and Glick's (1970) research showed that both partners in black-white unions had more education than black couples, but less education than white couples (Tucker and Mitchell-Kernan 1990:211). Quite the opposite, Heer's study (1974) using 1970 Census data "indicated that among both black males and females, those with 13 years or more education were more likely to be interracially married, while among whites, intermarriage was more prevalent among those with less than 9 years of education" (Tucker and Mitchell-Kernan 1990:211). Gullickson (2006) developed a single log-linear model to examine the effect of education on the odds of interracial marriage for black and white spouses. While he found a positive relationship between black spouses' educational attainment and their odds intermarriage, he found no such relationship for white spouses. His results were therefore more compatible with isolation theory than with structural assimilation theory.

Recent studies have shown that interracial couples have higher educational and economic status irrespective of the race/ethnicity of the spouses (Heaton and Albrecht 1996; Liberson and Waters 1988). Heaton and Albrecht (1996) used data from the 1980 and 1990 PUMS and found that the racial borders in mate selection are deteriorating. Moreover, they found that individuals in interracial unions, regardless of race or gender, are likely to have higher SES than those in racially endogamous unions. Liberson and

Waters (1988) also discovered that increases in education are related to increases in white interethnic marriage.

Analyses of education and intermarriage among Asian Americans have revealed inconsistent patterns. Sung (1990) and Wong (1989) both found positive relationships between education and intermarriage among Chinese Americans, while Hwang, Saenz, and Aguirre (1995) "found a negative relationship for women and no relationship for men" among several Asian American groups (Gullickson 2006:676). All told, research in this area is less conclusive than the work appraising status-caste and status homogamy theory.

While interracial marriage is a micro-level phenomenon, its occurrence is influenced by many macro-level dynamics and could well echo those dynamics. There have been several very important macro-level perspectives introduced by demographers and sociologists. I review them briefly here.

Blau's Structural Theories

Over the last thirty years, many sociologists have returned to structural perspectives, such as social network analysis (Marsden and Lin 1982), routine activity theories (e.g., Cohen and Felson 1979; Hindelang 1978), and group size and composition theories (Mayhew and Levinger 1976) to explain human behaviors (see also South and Messner 1986:1409). "Although these perspectives encompass a wide array of human behaviors, their common denominator is a concern with structural constraints on the opportunity for various behaviors to occur and a consequent de-emphasis on individual motivation" (South and Messner 1986:1409-10; Mayhew 1980, 1981). Structuralism

argues that a person's place in a particular social order will supercede cultural attitudes and personal preferences in predicting his or her behavior (South and Messner 1986:1410).

One well-known macrosociological theory of human behavior is Blau's *Inequality and Heterogeneity* (1977), which conceptualizes "social structure…as resting on a population's size distributions among different positions along various lines" (see Blau et al. 1982:45). His theory has been generously commended (Bell 1978; Catton 1978; Turner 1978) and has stimulated many investigations, from studies of intergroup crime (Sampson 1984; South and Messner 1986) to analyses of interracial marriage (Blau et al. 1982; Blau et al. 1984; Blum 1984; South and Messner 1986; Saenz and Creedy 1997).

Blau's main supposition is that there must be intergroup contact before intergroup relations can occur (Blau 1977:79). For that reason, the likelihood of social interactions rests on the number of opportunities for contact. Specifically, Blau and his colleagues have shown that "relative minority size, racial/ethnic diversity or heterogeneity, the extent of status inequality between minorities and others," and segregation all tend to impact the rate of intergroup relations in an area (Blau and Schwartz 1984; Blau et al. 1982; Blau et al. 1984; South and Messner 1986; see also Cready and Saenz 1997:338).

The relative minority size theorem suggests that a person's chances of marrying someone of another racial/ethnic group are higher in places where their group size is relatively small (Blau and Schwartz 1984:30-40; see also Cready and Saenz 1997:338;

Anderson and Saenz 1994; Hwang et al. 1994; Kalmijn 1993). The basis for this proposition is that both majority and minority groups must have the same number of outgroup associations with one another. Therefore, the mean number of associations for each group will rest on their population size, the denominator (Blau et al. 1982). Following this logic, "in its relation with any group that is larger, a group's rate of outgroup associations (per group member) exceeds the rate of the other group, and in its relation with any group that is smaller, a group's rate of outgroup associations is less than the rate of the other group" (Blau et al. 1982:47).

Heterogeneity refers to the number and size of various groups differentiated by a particular characteristic, such as race or ethnicity (Blau et al. 1982). Blau and colleagues (1982:47) define heterogeneity "as the chance expectation that two randomly chosen persons belong to different groups." This theorem suggests that communities with greater racial/ethnic heterogeneity will have more interracial encounters, which should increase the odds of interracial marriage.

Blau and Schwartz (1984) have shown that the degree of status inequality is negatively related to the probability of racial/ethnic intermarriage (cited by Cready and Saenz 1997:338). Status inequality involves differences in education, wealth, or prestige between two groups (South and Messner 1986:1411). As Cready and Saenz (1997:338) explain, "one's chances of meeting and marrying a member of another racial/ethnic group are higher in areas where status inequalities between groups are low" since "contacts between members of different groups depend on 'cross-cutting' or 'intersecting' social circles."

The last aspect of Blau's theory is segregation. Obviously, opportunities for intergroup interactions fluctuate across geographic areas (South and Messner 1986). Individuals residing in a predominately white neighborhood are unlikely to meet and form intimate relations with members of another racial/ethnic group. Accordingly, "spatial segregation is expected to exert an inhibiting effect on social relations," including interracial marriage (South and Messner 1986:1412; Blau 1977:90-93).

Several studies have tested the components of Blau's theory on interracial and interethnic marriages. In his investigation of intermarriage between blacks and whites, Heer (1966, 1974) found support for the relative group size theorem. Monahan (1970b, 1976) also discovered a relationship between relative group size and intermarriage among Hispanic groups in New York City. Blau and colleagues (1982, 1984) conducted a study of intermarriage between native and foreign-born individuals across 125 MSAs and noticed this relationship as well. Cready and Saenz (1997) observed this connection for African Americans and Mexican Americans in both metro and nonmetro areas.

In terms of the effects of heterogeneity, Blau and associates found the anticipated positive association with intermarriage, once controls were included that accounted for income inequality. Conversely, South and Messner (1986), Hwang and colleagues (1994), and Cready and Saenz (1997) all found that heterogeneity often has an insignificant or negative effect on racial/ethnic outmarriage, but concluded their findings were in harmony with Blau's group size theorem. They explain that "increased heterogeneity should *suppress* the probability of outgroup contacts for [minorities] and *enhance* it for the [majority]" (Fitzpatrick and Hwang 1992:53; see also Cready and

Saenz 1997:355; South and Messner 1986). South and Messner (1986:1426) suggest "the concept of heterogeneity is most appropriate for populations comprised of more than two groups."

In regards to status inequality, studies have shown it to have the anticipated negative association with rates of intermarriage (Blau et al. 1982, 1984; Blau and Schwartz 1984; Cohen 1977; Heer 1966). Indeed, South and Messner (1986) found income inequality to be the most important predictor of interracial marriage between whites and nonwhites. Cready and Saenz (1997) found this relationship to hold for African American men living in metropolitan areas, but not for those living in nonmetro areas.

Research on segregation indicates this structural element also impacts rates of intermarriage. Romantic relationships and marriages tend to occur among individuals who reside in close proximity of one another (Huckfeldt 1983; Katz and Hill 1958; Ramsoy 1966). This pattern often holds for interethnic and interracial marriages as well (see Lieberson 1961, 1963, 1980; Peach 1981; Blum 1984; Heer 1966).

Other Contextual Factors

Beyond Blau's social structural theorems, there are other macro-level forces that influence the occurrence of intermarriage. Several studies have shown that rates of intermarriage vary by geographic locale, being highest in the Western region of the United States and lowest in the South (Heer 1974; see also Tucker and Mitchell-Kernan 1990). This finding is easily explicable given the American South has been a historic stronghold for racism and higher levels of white prejudice than other areas of the United

States (Kuklinski, Cobb, and Gilens 1997; Golebiowska 2007). Studies emphasize the candid condemnation of interracial couples by white southerners, especially in rural areas where "black men with white women are made to feel that they have stepped out of line, while their white partners are characterized as depraved and immoral" (Romano 2003:256; Golebiowska 2007). Golebiowska's (2007) recent study on whites' attitudes toward black-white intermarriage demonstrates that objection toward interracial marriage is greater in the South, especially among rural residents. He also found that whites residing in the South were more likely to possess negative stereotypes about African Americans.

Past studies indicate that rural residents tend to hold more conservative and objectionable views toward interracial marriage than urban residents (Golebiowska 2007). According to Cready and Saenz (1997:340), "the 'urbanization' or 'modernization' hypothesis suggests that metro residents are not only less likely to subordinate personal goals to those of the family (Smith and Zopf 1970), they are also more likely to enter into 'nontraditional' marital and family arrangements, including those involving members of other racial/ethnic groups (Blau 1977:160-163)." Research demonstrates that urban residents are inclined to have a more liberal perspective on a variety of issues besides interracial unions, such as same-sex marriage (Glenn and Hill 1977; Larson 1978).

In his analysis of exchange orientations in marriage, Hansen (1987) found that urban residents were more apt to be exchange oriented than their rural counterparts (cited by Cready and Saenz 1997). In particular, he observed that "money," "status,"

and "information" have more influence over the marital outcomes of urban dwellers than they have over rural dwellers. Cready and Saenz's (1997) study of outmarriage among African Americans and Mexican Americans lends partial support to the "urbanization" hypothesis. While metro African American men were significantly more likely to be outmarried than their nonmetro counterparts, metro Mexican American men and women were significantly less likely to be outmarried than their nonmetro counterparts.

"Not only can residential context, whether at the regional or local level, shape racial attitudes, but the contours of people's interpersonal environments can have important implications for their racial attitudes as well" (Golebiowska 2007:9-10). Indeed, there are a number of additional factors that may influence rates of interracial marriage in an area, including intergroup contact, prevailing political and religious affiliations, and the presence of other alternative unions. I will now provide some discussion of these issues.

Prior studies have shown that intergroup contact under the right conditions can foster acceptance between members of different racial/ethnic groups (Allport 1954; Aberbach and Walker 1973; Ellison and Powers 1994; Meer and Freedman 1966; Schuman and Hatchett 1974; Robinson 1980; Sigelman and Welch 1993; Williams 1964; Yancey 1999, 2007). While contact theory is traditionally a micro-level perspective, Emerson, Kimbro and Yancey (2002) argue that the perspective be extended to encompass macro-level forces. Specifically, they broaden the application of contact theory from attitudes to behaviors "by examining whether prior contact with other racial groups leads to contemporary multiracial social ties" (Emerson et al. 2002:747).

Using data from the Lilly Survey of Attitudes and Social Networks, Emerson and colleagues (2002) explored whether those with prior mixed-race contact in schools and neighborhoods would be more likely to have interracial friendships, social ties, and marriages. They measured prior mixed-race contact by asking respondents if their former neighborhoods and schools were 20 percent or more of the non- [respondent's race]. They also included in their models various demographic and socioeconomic controls, such as education, age, gender, and income.

Their results showed that prior interracial contact has a significant effect on the racial composition of current friendship groups for whites, blacks, and Hispanics, but not for Asians (Emerson et al. 2002). Compared to respondents with prior mixed-race contact, respondents with no prior contact in schools or neighborhoods were 3.5 times as likely to have a friendship group composed entirely of same-race individuals. When the researchers isolated the effects of neighborhood and school contact on friendship circles, they found them to be of equal importance. Regarding the link to religious congregations, they found that individuals who "have both previously lived in a mixed neighborhood and attended a mixed school are 5.5 times more likely to be in a racially-mixed religious congregation when compared to those who had neither experience," with neighborhood effects exerting the greatest relative impact (Emerson et al. 2002:756). Lastly, their study demonstrates that prior interracial contact influences marital outcomes. While only 2.5 percent of those with no prior mixed-race contact were intermarried, 13 percent of those who had prior contact in neighborhoods and schools were intermarried. For African Americans, the odds of being intermarried are 7

times greater for those with prior contact than for those with no prior contact; for whites, the odds are 2.5 times greater (Emerson et al. 2002:756-7).

Other analyses also lend support to the contact hypothesis. In his qualitative study using focus group interviews, St. Jean (1998:409) found that "partners who grew up in a mixed neighborhood found it an advantage and suggested that the experience shaped their attitudes toward racial issues and toward intermarriage in a positive manner." St. Jean speculates that individuals who are raised in a "universal environment" have less concern with color and its importance as a foundation for social participation and interaction.

Yancey (1999) studied the impact of racial integration within residential and religious settings on the racial attitudes of whites. Although residential integration had no significant bearing, religious integration modified racial attitudes. His study demonstrates "the most powerful effects of attending integrated churches are that white respondents engage in less stereotyping and have lower levels of social distance" (Yancey 1999:297). On the other hand, integrated religious institutions did not have a significant effect on measures of overt racism. He speculates that this may be related to the "Christian emphasis on free-will individualism," which is the notion that individuals are accountable for their own fates, good or bad (Yancey 1999:298; see also Stark and Glock 1969).

According to Hacker (1992), whites are agreeable to there being a few African Americans in their neighborhood, "but when the number of blacks reaches a 'tipping point' of 8 percent, then whites begin an inevitable process of white flight" (Yancey

1999:298). This means that whites may abandon environments, or consider doing so, where African Americans are numerically large enough to attain a small degree of social power. Emerson and colleagues (2001) explore these issues in their study of residential segregation and white preferences. They discovered that "Asian or Hispanic neighborhood composition exerts no independent influence on whites' assessed likelihood of buying a home," while "black neighborhood composition…matters significantly, even after controlling for proxy variables" (Emerson et al. 2001:931). Whites were amenable to a "token" black population, but once neighborhood composition exceeded 15 percent black, whites were unlikely to live there. Parents with children under 18 were most deterred by black presence, suggesting "that insofar as white parents are able to realize their preferences, black children and white children will continue to be segregated from one another" (Emerson 2001:932).

Yancey (1999) suggests that whites who remain in situations with a strong black presence will have racial attitudes unlike the whites who flee. Plausibly, the whites who stay in neighborhoods or religious institutions with high racial integration are likely to have more tolerant racial attitudes than their counterparts who take part in white flight. This "selectivity effect" makes it difficult to determine the extent to which racial integration improves racial attitudes since the most intolerant whites are likely to have already removed themselves from such situations. Even with this question of causality, Yancey (1999) concludes that interracial contact is likely to have some independent effect on individuals' racial attitudes.

Several studies have found opposition to racial integration within certain philosophical traditions and religious denominations. There is some indication that "individuals with conservative religious beliefs have historically held theological beliefs that prohibit racial exogamy" (Yancey 2002:181). The written works of Hall (2000) and Small (1959) are illustrative of the Christian contention that interracial mixing is "sinful" (cited by Yancey 2002). On the other hand, Yancey (2002) finds it conceivable that more progressive Protestants (see Schuman and Steeh 1996) may be ill at ease with this injunction. These Protestants may be outwardly accepting of interracial dating and marriage for others, but refrain from such activities themselves.

While some Protestant churches may be accepting of interracial relationships, some African American churches may fervently object to such unions. Given that African American religious establishments have been locations for activism and change (Harris 1994; McAdam 1982; Pattillo-McCoy 1998), Yancey and Emerson (2001:137) find it "plausible that the resentment of African Americans toward interracial marriages may be expressed within strong Black religious communities."

Catholics may also eschew interracial unions, but their reasons for doing so are not inevitably linked to their religious beliefs (Yancey 2002). American Catholicism is often centered within certain racial/ethnic groups (Froehle and Gautier 2000; Morris 1997), so "a Catholic who dates within his/her own faith may be limited to racially endogamous dating" (Yancey 2002:181).

Past research has also observed a relationship between individuals' political affiliation and their position on interracial marriage (Kinder and Sanders 1996;

Sniderman and Piazza 1993). In general, "Democrats and ideological liberals should hold more favorable attitudes toward interracial marriage than Republicans and ideological conservatives" (Golebiowska 2007:11). Golebiowska (2007) found support for this hypothesis, as Republicans and conservative respondents were more likely to "exhibit more lukewarm or actively hostile reactions to a possibility that a close member of their family might marry a Black person," compared to their liberal counterparts. Johnson (2004) analyzed data from a national racial poll performed by the New York Times and found that political party affiliation is a significant aspect in predicting opinions toward intermarriage. He found that "the odds of Democrats approving interracial marriage were about 75 percent higher than the odds for Republicans" and "the odds of approving of interracial marriage for those without a political party identification were approximately one and one-quarter times higher than the odds for Republicans" (Johnson 2004:31).

In recent years, scholars have seen parallels and have drawn many connections between the resistance that once targeted interracial marriage and that which is presently directed at same-sex marriage (Forde-Mazrui 2003; Wood 2004; Rosenfeld 2007). Like the challenges to gay marriage, "much of the opposition to interracial relationships was grounded in religious beliefs," notes law professor Kim Forde-Mazrui (Wood 2004:1). In *Loving v Virginia*, the state of Virginia defended its law against interracial marriage to the U.S. Supreme Court by citing religious beliefs. In the Virginia state court that first rejected the Lovings' appeal and ruled in favor of the ban on intermarriage, Rosenfeld (2007: 171) writes that Virginia circuit court Judge Leon Bazile stated that "Almighty

God created the races white, black, yellow, malay and red, and he placed them on separate continents. And but for the interference with his arrangements there would be no cause for such marriages. The fact that he separated the races shows that he did not intend for the races to mix" (see also Moran 2001:95).

In addition to the contention that interracial unions violated God's will, Virginia also cited scientific claims that racial mixing desecrated biological laws and thus may pose a significant threat to "the genetic vitality of human society" (Rosenfeld 2007:171). In fact, many opponents suggested that such an amalgamation may produce unhealthy children—"perhaps mentally retarded or a mongrel breed" (Wood 2004:1). The attorney general of Virginia stated, "scientific breeders have long ago demonstrated that the most desirable results are secured by specializing types rather than by merging them" (Rosenfeld 2007:171). Opponents of same-sex marriage are currently reusing these arguments, claiming that "sex between people of the same sex is unnatural" or even "bestial" (Wood 2004:1).

Not too long ago, such arguments had the support of the scientific community. Until 1973, the American Psychiatric Association classified homosexuality as a psychological disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM).

Another argument against interracial marriage presently being used against same-sex marriage is that that it violates family values and is both harmful and confusing for children (Rosenfeld 2007; Wood 2004). This line of reasoning has been a particularly effective tool for social control since most people sympathize with the needs of children.

There have also been arguments against couples adopting children of a race different from their own, especially white couples adopting black children (Wood 2004). According to the National Association for Black Social Workers, such living situations "may result in black children having 'white minds'" (Wood 2004:2). Likewise, many oppose adoption rights for gay couples for fear that their children would become targets of prejudice. Forde-Mazrui (Wood 2004:2) states there are additional concerns that children of same-sex couples will "have confusion over their sexual orientation…or worse, they'll end up being gay."

Legal acceptance of same-sex marriage could follow the same path as interracial marriage, where there is gradual increase in the number of states allowing same-sex marriage licenses (Rosenfeld 2007). After a few states, like Massachusetts and, more recently, California, grant same-sex licenses with no dire consequences, other states may follow their lead. Although there has been backlash against same-sex marriage and against states that recognize such unions, the ever-increasing number of gay marriages "will lend credibility and normalcy to gay parents and gay couples" (Rosenfeld 2007:181). Rosenfeld (2007:181) believes that "opposition arguments against same-sex marriage that now sound reasonable may in the future sound strained, strident, and intolerant, like the last gasps of state arguments against interracial marriage in the mid-1960s."

In addition to their comparable legal battles, interracial and same-sex couples have also shared similar numerical trajectories since the emergence of the independent life stage in the 1960s (Rosenfeld 2007). As explained in Chapter I of this dissertation,

the independent life stage has increased the numbers of alternative unions by lessening

parental power and supervision. As same-sex and interracial unions become more

widespread, they become more commonly accepted by society. Rosenfeld's analysis

demonstrates that interracial and same-sex couples are much more geographically

mobile than other couples and have an exceptional draw to urban living. This is

consistent with the abovementioned findings that metropolitan residents are more likely

to accept and engage in interracial unions (see Golebiowska 2007; Cready and Saenz

1997; Smith and Zopf 1970; Blau 1977; Hansen 1987; Glenn and Hill 1977; Larson

1978). Given that both interracial couples and same-sex couples face similar types of

discrimination that motivate them to live in cities and liberal surroundings, it is likely

that their rates of occurrence are related to one another.

Conclusion

To ascertain the degree to which the various individual-level theories of

interracial marriage are effective, and whether one stands out above the others, I will

develop and evaluate several logistic regression models. Subsequently, I will use

hierarchical generalized linear modeling (HGLM) to explore the impact of various kinds

of macro-level characteristics on the probability of interracial couples living in certain

metropolitan areas. Specifically, I will inquire whether or not conservative

representation impacts the odds of interracial couples living in the population; this will

be gauged through the political and religious composition of the population. Given that

intermarried couples are statistically non-normative, I expect them to follow similar

residential patterns as gays, lesbians, and unmarried heterosexual cohabiters. Therefore,

I will also explore whether the presence of homosexual cohabiters and unmarried heterosexual cohabiters in a metropolitan area is positively related to the odds of an interracial couple also being located in the area.

In the final phase of my analysis, I will develop another series of multi-level models to evaluate Blau's social structural theorems (i.e. relative minority size, racial/ethnic heterogeneity, status inequality, and segregation). In order to test Blau's theories, one really needs to know where the couples got married, not where they are presently residing, and the ACS does not ask such a question. Therefore, I will have to rely on an inexact approximation of nuptial location obtained by restricting the analysis to women aged 20-29 who have not migrated in the last year. In these more restricted models, I will include measures of segregation, race and sex composition, and unemployment. In the next chapter, I will present a discussion of the data and methods to be used in this dissertation.

CHAPTER III

DATA AND METHODS

Chapter III provides a thorough description of the American Community Survey (ACS), addressing its development, sampling design, questionnaire content, data collection, and weighting procedures. Additionally, the dependent variable, each of the level-1 independent variables, and selected level-2 independent variables will be operationalized. I also explain my reasoning for including them in the study and also attend to individual measurement issues. Lastly the statistical methods to be used in my analysis will be dealt with individually in considerable detail.

Data

My dissertation analyzes two dichotomous dependent variables for all white and black women living in U.S. metropolitan areas: intermarriage among black females and intermarriage among white females. For both black and white females, intermarriage is a dummy variable scored "1" if an individual's husband differs from her in race; it is scored "0" if her husband is of the same race. My analysis is restricted to non-Hispanic whites and non-Hispanic blacks; all other race and ethnic groups were dropped from the sample. The data source for my dependent variables is the American Community Survey (ACS) 2006 sample. The ACS data were extracted using the Integrated Public Use Microdata Series: Version 3.0, made available by the Minnesota Population Center (Ruggles et al. 2004).

The ACS is a national survey designed to "provide estimates of demographic, housing, social, and economic characteristics every year for all states, as well as for all

cities, counties, metropolitan areas, and population groups of 65,000 people or more" (census.gov/acs). The ACS will replace the long form in future decennial censuses, supplying policy makers and researchers with access to population and housing data on an annual basis (as opposed to once every ten years). The continuous measurement or "rolling" design of the ACS was first suggested and discussed between 1990 and 1993, then later developed and tested by the Census Bureau in a limited number of locations between 1994 and 1999 (U.S. Census Bureau 2006:13). Between 2000 and 2004, nationwide surveys were conducted that generated data for the country, states and large geographic areas. Finally, in January 2005, the ACS was fully implemented with the sampling of approximately three million household units throughout the United States. In May 2006, the Census Bureau released an extensive technical paper on the ACS entitled *Design and Methodology: American Community Survey*, which is available to the public online. In an attempt to provide a broad synopsis of the ACS and its procedures, I will review key chapters of this paper in the following paragraphs.

Frame Development

The American Community Survey (ACS), the decennial censuses, and other Census Bureau surveys all hinge on the nationwide Master Address File (MAF) that is maintained by the U.S. Census Bureau. The MAF is a massive "inventory of known living quarters (housing units (HUs) and group quarters (GQ) facilities) and selected non-residential units (public, private, and commercial) in the United States and Puerto Rico" (U.S. Census Bureau 2006:27). The original MAF used for Census 2000 was constructed from several sources, including the "1990 address control file, field listing

operations, the U.S. Postal Service's (USPS's) delivery sequence file (DSF), and addresses supplied by local governments through partnership organizations like the Local Update of Census Addresses (LUCA) and other Census 2000 activities such as the BE Counted Campaign" (U.S. Census Bureau 2006:29). The 2000 MAF served as the base frame for the current MAF, which is constantly updated via the DSF and a mixture of census field operations, including the Community Address Updating System (CAUS).

In addition to basic mailing information, the MAF contains geocodes and attribute data about all living quarters thus enabling the MAF to be joined to the Topological Integrated Geographic Encoding and Referencing (TIGER) files. The TIGER database is used for data analysis and for the creation of detailed maps containing the geographic positions of all MAF addresses. This system permits users to "sort the MAF in different geographic hierarchies," consisting of state, county, tract, and block levels (U.S. Census Bureau 2006:28).

Design of the Sample and Sample Selection

On an annual basis, the ACS samples approximately 3 million housing units (HUs) from the 3,141 counties and county equivalents in the United States. Each HU in the sample is appointed one month for which it qualifies to receive the mail-out questionnaire. A response, either by mail or interview, must be obtained from a HU within three months of the initial mail-out. "Two separate sampling operations are carried out at different times to determine the addresses that will be assigned to each month during a given calendar year—the main sample is selected in August/September preceding the sample year and the supplemental sample is selected in January/February

of the sample year" (U.S. Census Bureau 2006:36). The main sample is based on the

Master Address File (MAF) available during the first sampling operation. The

supplemental sample is based on the addresses added to the MAF since the first

sampling period.

An HU address is only eligible to be sampled one time over a five-year period.

"To accommodate this restriction, the addresses in the frame are randomly split into five

sub-frames, each containing 20 percent of the frame" (U.S. Census Bureau 2006:37).

Each year, the ACS samples only one of the five sub-frames, and each sub-frame can

only be used once every five years. Consequently, both the main and supplemental

sampling operations are two-step processes. Before either sample is taken, both the

MAF and the supplemental MAF must be randomly divided into five sub-frames;

subsequently, one frame of addresses for the main and supplemental operations is

selected for the sample year.

Content Development Process

As was the case for the census long form questionnaire, the ACS was developed

specifically for the needs of federal government agencies. The Census Bureau and the

Office of Management and Budget (OMB) worked together to determine the content for

the survey with these needs in mind. The long form was very limited in scope; its

questions had to be directly related to federal programs, federal laws, or the

programmatic needs of the Census Bureau. To prevent degradation of data quality, the

ACS underwent similar restrictions. After a complicated process involving the OMB,

the Census Bureau, the Department of Commerce, and all the federal agencies that use

census data, the "end result was a 2003 through 2007 ACS questionnaire with content almost identical to the Census 2000 long-form questionnaire content" (U.S. Census Bureau 2006:49). The ACS is comprised of 25 housing and 42 population questions. ACS content can only be amended once a year, and both the OMB and the Census Bureau must approve all new content.

Data Collection and Capture for Housing Units

"The ACS achieves a high total response rate each year, due in part to the data collection design, which reflects experience and research in data collection strategies from the Census Bureau's decennial census and demographic survey programs" (U.S. Census Bureau 2006:69). Success may also be attributed to the hard work of the interviewing staff and to the federal law that makes participation mandatory for all households.

Three methods are used to collect data for housing units (HUs): mail, telephone, and personal visit. Mail is the primary form of data collection. Because it is the most cost effective method, high response rates are crucial for the overall success of the survey. Addresses must meet specific criteria to be deemed deliverable by the USPS. In 2005, 95 percent of the total sample addresses were deliverable. HUs with incomplete addresses are retained in the sample frame, but they only qualify for computer-assisted personal interviewing (CAPI). Mail response is so important to the ACS that three and sometimes four mailings are sent to each HU, namely, a pre-notice letter, the initial mail package containing the questionnaire, a reminder postcard, and a replacement mail package if a response was not received within 3.5 weeks after the initial mail package.

Once all the mail-returned questionnaires are received, they are sent through a computerized editing system which checks for consistency and completeness. Cases that do not pass the edit qualify for the telephone failed-edit follow-up (FEFU) operation, wherein Census Bureau staff calls HU respondents in an attempt to secure missing data. In 2005, 33 percent of the mail-returned questionnaires necessitated FEFU.

The second stage of ACS data collection is computer-assisted telephone interviewing (CATI), which starts around five weeks after the initial mail package was sent out. CATI is used if a HU failed to return a mail-out questionnaire and a telephone number is available for the address. "The CATI operation has a strong quality assurance program, including CATI software-related quality assurance and monitoring of telephone interviewers" (U.S. Census Bureau 2006:78). This prevents telephone interviewers from inputting inadequate or incorrect responses and/or skipping questions. There are roughly 650 CATI interviewers at the Census Bureau's three call centers located in Tucson, Arizona, Hagerstown, Maryland, and Jeffersonville, Indiana.

The third and final stage of ACS data collection is computer-assisted personal interviewing (CAPI), which typically starts on the third month of data collection. While an effort is made to contact the HUs by telephone, around 80 percent of CAPI cases require a personal visit from Census Bureau field representatives (FRs). The FRs are "trained in how to handle almost any situation, ranging from how to respond to a household that claims to have returned their questionnaire by mail to how to handle an interview with a non-English speaking respondent" (U.S. Census Bureau 2006:80). Unattainable interviews may result from a variety of factors including refusal, natural

disasters during the interview period, or non-existent addresses. These cases are "taken seriously because they impact both sampling and non-sampling error" (U.S. Census Bureau 2006:80). There are approximately 3,500 FRs who perform CAPI interviews in the United States and Puerto Rico.

Weighting and Estimation

"Beginning in 2010, three sets of American Community Survey (ACS) estimates will be calculated annually for specified geographic areas using data collected over three different time periods" (U.S. Census Bureau 2006:108). The ACS estimates will correspond to the "same set of statistical, legal, and administrative entities that were produced and published for the Census 2000 long form sample" (U.S. Census Bureau 2006:108). The population size in each geographic area establishes whether the area's estimates will be derived from five years, three years, or a single year of sample data. Data for entities such as census tracts, block groups, and small cities and towns will be based on five-year estimates. Data for entities with populations of at least 20,000 will be based on three-year estimates, and data for entities with populations of at least 65,000 will be based on single-year estimates. The three- and five-year period estimates are updated annually, as the latest data supplant the earliest data in the preceding years' estimates.

A ratio estimation procedure is used that allocates two sets of weights: "a weight to each sample person record and a weight to each sample housing unit (HU) record" (U.S. Census Bureau 2006:108). Accordingly, estimates of family, household, and HU characteristics for an area are derived from the HU weight, while estimates of person

characteristics are derived from the person weight. These weights serve the purpose of bringing the attributes of the weighted sample into accord with the attributes of the entire population. "The weights compensate for differences in sampling rates across areas, for differences between the full sample and the interviewed sample, and for differences between the sample and independent estimates of basic demographic characteristics" (U.S. Census Bureau 2006:108; Alexander, Dahl, and Weidman 1997).

The data for my dissertation were extracted from the ACS 2006 sample, which includes approximately 1,344,000 household and 2,970,000 person records. The Public Use Microdata Area (PUMA), which contains as a minimum 100,000 persons, is the smallest geographic unit available in this sample. My analysis will only include households in metropolitan areas, so the geography limitations of the 2006 ACS should pose few problems.

According to the 2006 ACS sample, there were 317,255 non-Hispanic white females surveyed that lived in the metropolitan areas of the U.S., 0.79% of which were married to black males. Conversely, there were 21,764 non-Hispanic black females in the metro sample, 2.83% of which were married to white males. Thus, a greater percentage of black females were intermarried than their white counterparts.

The data for my level-1 independent variables will also be taken from the 2006 ACS sample. Various independent variables will be used in my regression models, following the principal theoretical approaches for analyzing interracial marriage, as discussed in Chapter II. Two independent variables will be used to test the validity of status-caste exchange theory in predicting the odds of being in an interracial marriage:

the husband/wife Duncan SEI ratio and the husband/wife education ratio. The

husband/wife Duncan SEI ratio employs the Duncan Socioeconomic Index (SEI) score

that is assigned to each occupation, based on the income level and educational

attainment required for each occupation. To construct ratios, I divided the husband's

SEI score by the wife's SEI score; ratios above 1 indicate the husband has a higher SEI

score than the wife. The husband/wife education ratio was constructed with the

educational attainment recode variable (EDUCREC). First, I recoded EDUCREC into

an interval variable that better reflects years of educational attainment. To construct

ratios, I divided the husband's educational attainment by the wife's; higher ratios

indicate higher educational achievement by the husband. Status-caste exchange theory

predicts that among intermarried couples, black spouses will have higher SES than white

spouses, suggesting that both of these ratios should have a positive association with the

odds of intermarriage for white females, and a negative association for black females.

To examine the efficacy of status homogamy theory, I will again employ two

independent variables: homogamy SEI and homogamy education. I created each of

these variables by taking the absolute value of the difference between the husband's and

the wife's scores on the SEI and on educational attainment. Status homogamy theory

expects that spouses will have similar levels of educational attainment and economic

success. Accordingly, the homogamy SEI and homogamy education variables should

both be negatively related to the odds of being in a black-white marriage for both groups

of women.

The last individual-level theory I plan to examine is the notion that people who intermarry will have higher educational attainment and economic status than those in endogamous marriages. Structural assimilation theory predicts a positive association between SES and intermarriage for blacks and whites, while isolation theory predicts this relationship only for blacks and assumes no association, positive or negative, for whites. I will use three variables in my economic/educational success model: wife's education, wife's SEI, and wife's income.

At the macro-level, I have available for each of the metropolitan areas data on the prevalence of Republicans and Southern Baptists. I have gathered data for each metropolitan area on the percentage of votes cast in the 1996 presidential election for the Republican candidate, Robert Dole. And I have also obtained data for each metropolitan area on the number of Southern Baptist members per 1,000 population in 2000. I have also drawn on the work of Poston and others who have made available to me for each of the 331 metropolitan areas in 2000 the prevalence rates of partnered gay men, partnered lesbians, and partnered heterosexual cohabiters. I will examine the direct effects of these macro-level variables on my two dependent variables, and I will also examine the effects of these macro-level variables on each of the slopes of my micro-level independent variables on my two dependent variables. Several other contextual variables will be used in the models to examine Blau's structural theories. I will present the operationalization of these variables in Chapter VI.

Logistic Regression

Many studies on interracial marriage have used log-linear analyses (e.g. Kalmijn (1993; Rosenfeld 2005). While this method has many advantages, one limitation is that it requires variables with discrete categories (e.g. education). Since I will be incorporating several continuous variables in my analysis (e.g. income and SEI, among others), I will use logistic regression, which permits the estimation of probabilities in models containing continuous and/or categorical independent variables.

I will employ logistic regression to examine the applicability of three individual-level theories of interracial marriage: status-caste exchange, status homogamy, and educational/economic success. Logistic regression is used when we have a dichotomous (or binary), as opposed to continuous, dependent variable. In this case, my dependent variable assumes the value of 1, or yes, if the woman is in an interracial marriage, and the value of 0, or no, if the woman is not in an interracial marriage. The mean of the variable is the proportion of times that the dependent variable receives the value of 1.

Logistic regression converts the dependent variable into a logit, or the natural logarithm of the odds of success. Thus, logistic regression estimates the probability of a certain event occurring, such as the logit of out-marrying. This method typically uses maximum likelihood (ML) estimation. "ML estimates are the values of the parameters that have the greatest likelihood (i.e., the maximum likelihood) of generating the observed sample of data if the assumptions of the model are true" (Long and Freese 2003:68).

I will perform a series of logit diagnostics in the building and development of my models. First I will test for collinearity among my independent variables, as educational attainment, income, and occupational status have the potential to be interrelated. That is to say, individuals with high levels of educational attainment generally have higher incomes and occupational status than individuals with low levels of educational attainment. Severe multicollinearity will cause my parameter estimates to be inaccurate. Thus, a number of measures will be taken to address this prospective problem. Initially, I will inspect the zero-order correlations among each pair of my independent variables, observing the strength of the correlations. Correlations above 0.5 or 0.6 signify possible collinearity problems. Since zero-order correlations have a tendency to obscure certain problematical issues, I will next examine scatterplots of each bivariate relationship. In my examination, I will be looking for heteroscedasticity, curvilinearity, and collinearity problems.

Lastly, I will examine tolerance values of the questionable X variables, to determine if multicollinearity is too extreme. I will be concerned if the tolerance value for any of my X variables is under 0.35 (i.e. 1/tolerance = VIF), and logistic regression equations with these types of problems will not be estimated. Owing to collinearity issues, I plan to split my analysis into several different models. Each model will be composed of independent variables that have correlations under 0.5 or 0.6. This conservative approach will probably result in models containing no more than two or three independent variables. Consequently, I expect this may require me to estimate several different logistic regression equations.

In Ordinary Least Squares (OLS) regression, it is assumed that the errors are normally distributed (Menard 1995:72). This assumption does not apply in logistic regression. "Instead, it is assumed that the distribution of the errors follows a binomial distribution, which approximates a normal distribution only for large samples" (Menard 1995:72-3). If the residuals are normally distributed for a large sample, one can be relatively secure that the inferential statistics are correct since normal and binomial distributions are roughly the same for large samples (Menard 1995:73).

In order to check for non-normality, I will calculate a standardized Pearson residual for each model[5]. The Pearson residual, known as *r*, is the difference between a model's predicted probability and the actual values of the observations in the sample (Long and Freese 2003:123). While there is generally little difference between the unstandardized *r* and the standardized Pearson residual, r^{Std}, Pregibon (1981) recommends using the standardized version because it has a constant variance (Long and Freese 2003:125). To determine whether the residuals approximate a normal distribution, I will examine skewness and kurtosis values, as well as mean and median contrasts. The skewness value in a normal distribution is 0. If skewness surpasses 0.8 in absolute value, the distribution is likely skewed. I will also appraise skewness by

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[5] Following Hamilton (1992:235-36), **J** denotes the number of unique X patterns in the sample; m_j denotes the number of cases with the jth X pattern; **P-hat$_j$** denotes the predicted probability that Y = 1, for cases with pattern j; Y_j denotes the sum of Y values for all cases with pattern j; r_j denotes the Pearson residual for j[th] X pattern; χ^2_P denotes the Pearson χ^2_P statistic; h_i denotes the leverage of the ith case; and h_j denotes the leverage of the jth X pattern. The Pearson residual is:

$$r_j = \frac{Y_j - m_j \hat{P}_j}{\sqrt{m_j \hat{P}_j (1 - \hat{P}_j)}}$$

comparing the values of the mean and median, which are the same in a normal distribution. If the mean has a lower value than the median, then the distribution is skewed left. If the mean has a higher value, it is skewed right. After my evaluation of the summary data, I will visually inspect the distribution of the Pearson residuals by plotting them against a normal curve.

In addition to tests for collinearity and non-normality, Menard (1995:77) believes a "test for nonlinearity…should also be incorporated as a standard procedure in logistic regression." As Vittinghoff and colleagues (2005:190) explain, logistic regression is similar to linear regression in that "the uncritical adoption of the assumption that variables are linearly related to the outcome can lead to biased estimates and incorrect inferences." Accordingly, I will utilize a LOWESS scatterplot to determine if there are any major digressions from linearity. The "lowess" command in Stata will generate a graph of the log odds estimated by LOWESS smoothing methods (the uneven line), as well as the linear logistic fit (the diagonal line) (Vittinghoff et al. 2005). For each of my logistic models, I will be examining the proximity of the LOWESS line to the diagonal line. The tighter the two lines, the more confident I will be about the fit and linearity of my models.

While LOWESS is an important technique for addressing potential nonlinearity problems, it does not consider the adequacy of the logistic model; rather, it "implicitly assumes that the logistic model is correct" (Vittinghoff et al. 2005:192). According to Vittinghoff and colleagues (2005:192), "a simple (and rather crude) approach to evaluating whether a given logistic model provides an adequate description of the data is

through the use of a *specification test*." Stata's "linktest" command presents this kind of model specification. My first step will be to estimate the logistic regression model. Subsequently, via "linktest," I will estimate a second equation "using the estimated right-hand side (i.e., the linear predictor) from the previously fitted model as a predictor" (Vittinghoff et al. 2005:192). If the original model provided a reasonable fit, there should be a statistically significant result (z-test 2.0 or above) for the predictor (labeled in the output as _hat). Also in the output is the square of this predictor (labeled _hatsq). The squared linear variable should not enhance the prediction if the original model is indeed adequate; thus, I will be looking for a z-test score on "_hatsq" below 2.0. If "_hatsq" is significant (z-score 2.0 or above), this will suggest that the variables I am using in the original model are not fully adequate. This may well occur with one or more of the tests of the three theories I am using in my models. Since I am not developing a comprehensive theory of interracial marriage, but instead am testing the applicability of three distinct theories, I may or may not need to more completely specify a model if the "linktest" shows that it is not adequate.

Besides the test of model adequacy using "linktest," I will examine other measures of model fit. A very familiar statistic in OLS regression used to gauge the overall fit of the model is R^2. The R^2 statistic is calculated by dividing the sum of squares accounted for by the model by the total sum of squares. One of the limitations of logistic regression is that it does not have a goodness-of-fit measure; however, several proxies for the R^2 statistic are available (Hagle and Mitchell 1992:762-63). As Hagle and Mitchell (1992:763) note, "many probit and logit computer algorithms present one

or more pseudo- R^2s; the difficulty facing the analyst is selecting from among the pseudo- R^2 measures." Because none of the pseudo- R^2s "support a straightforward explained-variance interpretation, as does true R^2" there is little agreement in the literature regarding which pseudo- R^2 is best (Hamilton 1992:233; Hagle and Mitchell 1992:763). The Stata command, "fitstat," provides numerous goodness-of-fit statistics from which to choose, one being McKelvey and Zavoina's R^2.

In building their model, "McKelvey and Zavoina (1975:105-6) specifically assume the existence of an underlying, unobserved interval-level (continuous) dependent variable that, if it could be measured, would satisfy a linear model" (Hagle and Mitchell 1992:763). McKelvey and Zavoina's R^2 uses the "logit coefficients…to calculate explained variance by computing the variance of the forecasted values for the latent dependent variable" (Hagle and Mitchell 1992:764). This is represented as var($\hat{y}_i$). "The disturbances have unit variance. Total variance then reduces to explained variance plus one, and the McKelvey-Zavoina pseudo-R^2 (1975:111-12) then becomes" (Hagle and Mitchell 1992:764) represented by the following formula:

$$R^2 = \frac{var(\hat{y}_i)}{1 + var(\hat{y}_i)}.$$

Both Hagle and Mitchell (1992) and Windmeijer (1995) employed simulation techniques to determine which of the pseudo- R^2s most closely approximates the R^2 and found McKelvey and Zavoina's R^2 to be one of the finest proxies (see also Long and Freese 2003:163). Although I will use additional pseudo- R^2 statistics to evaluate my models, such as McFadden's R^2, I will be relying primarily on McKelvey and Zavoina's R^2 because it allows for a latent interpretation of the dependent variable.

In the social sciences, it is often advantageous to conceptualize and explain our dichotomous dependent variable in terms of this latent variable Y, especially when the dependent variable involves decision making (see Long and Freese 2006:110; Aldrich and Nelson 1984:30-40; Hagle and Mitchell 1992:763). In this way, the latent dependent variable can signify the probability of an event occurring, such as an interracial marriage. For example, not all women with a score of 0 on the dependent variable, intermarriage, share the same probability of one day participating in an interracial marriage. Some of these "zero" women may have graduated from a racially diverse university in a large city, while other "zero" women may have graduated from a racially homogeneous high school in a small town. Reasonably, the more educated urban women would have higher probabilities of eventually scoring a 1 on the dependent variable, intermarriage, than the less educated rural women.

The final diagnostic issue I will address is influence. Specifically, I will be looking to see if there are any outlying covariate patterns in my models that appear on both the Pregibon's ΔB_j (known as dBeta) and Change in Pearson χ^2 (known as $\Delta\chi^2_{P(j)}$) statistics (Menard 1995).

The Change in Pearson χ^2 ($\Delta\chi^2_{P(j)}$) statistic measures the reduction in Pearson χ^2 that would occur were one to remove all cases with a particular covariate pattern[6] (Hamilton 1992). Essentially, this statistic quantifies how inadequately the model fits the jth pattern. Sizeable values suggest the model would fit the data better if the jth

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[6] Following Hamilton (1992:235-36), the Change in Pearson χ^2 statistic is:
$$\Delta\chi^2_{P(j)} = r^2j \, / \, (1 - h_j)$$

pattern were removed. I will first utilize Stata to generate a list of $\Delta\chi^2_{P(j)}$ values for each unique covariate pattern. Next, I will have Stata graph the values of $\Delta\chi^2_{P(j)}$ on the predicted probability of being in an interracial marriage. This will allow me to visually inspect the number of covariate patterns in the model, as well as the patterns that show up as outliers. Finally, I will determine how many women are in each of the patterns having undue influence on the Pearson χ^2 statistic. I will re-estimate the logistic model without these cases to determine if they are having a large effect on my results and inferences. I will determine whether the statistical inferences I make regarding each of the effects in the logit equation change when I delete the cases. If there are no inference changes, I will retain the outliers in my final model.

The last diagnostic statistic I will use is Pregibon's ΔB_j (known as dBeta), which was created by D. Pregibon (1981) and is comparable to the Cook's D diagnostic used in OLS regression analyses (Long and Freese 2006:151). Pregibon's ΔB_j measures the change in the estimated logistic parameters that would be produced after removing all observations with the jth X pattern[7] (Hamilton 1992:236). In the same way as the $\Delta\chi^2_{P(j)}$ statistic, Stata will generate values of ΔB_j for each observation, which will then be grouped into the unique covariate patterns. After examining the ΔB_j values, I will have Stata graph the values on the predicted probability of being intermarried. Like the Cook's D statistic, any values of ΔB_j that are greater than 1 require attention. I will next examine the amount of prediction error in each of the problematic patterns.

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[7] Following Hamilton (1992:235-36), the Pregibon's ΔB_j statistic is:
$$\Delta B_j = r^2_j h_j / (1 - h_j)^2$$

Hierarchical Generalized Linear Model (HGLM)

Multilevel models are often used in the social sciences to ascertain the effect of context on individual-level outcomes (DiPrete and Forristal 1994:331). A great deal of sociological and demographic research necessitates multilevel models, since both individual- and contextual-level characteristics influence the majority of human behaviors. For example, a migration outcome is not only affected by the characteristics of a person, such as his/her age, education, and income; it is also affected by the characteristics of that person's family, neighborhood, metropolis, and so on. The importance of social context is not a recent realization in sociology. As DiPrete and Forristal (1994:331) have written:

> The idea that individuals respond to their social context is a defining claim of the sociological discipline, which is found on Marx's work on political economy (1846), in Durkheim's studies of the impact of community on anomia and suicide (1987), in Weber's research on how religious communities shape economic behavior (1905), in Merton's work on communities, relative deprivation, and social comparison theory (1968), and in Berelson et al's (1954) research into the effect of social context on voting.

A cross-national study of fertility by Mason, Wong, and Entwisle (1983) provides an excellent example of multilevel research in demography (cited by Raudenbush and Bryk 2002:3). Their investigation considered how differences in national socioeconomic development and family planning interacted with women's educational attainment to impact fertility rates. The socioeconomic and family planning data were gathered at the national level, while the education and fertility data was gathered at the individual level. This study contained a true hierarchical structure, as the

individual women and their households were nested within countries (Raudenbush and Bryk 2002:3).

An abundance of multilevel research originated in the field of education (Raudenbush and Bryk 2002). "Educational research is often especially challenging because studies of student growth often involve a doubly nested structure of repeated observations within individuals, who are in turn nested within organizational settings" (Raudenbush and Bryk 2002:4). Research on instruction sometimes even requires a three-level hierarchical structure: the progress of students over the research period (level-1), the impact of individual-level characteristics and experiences on student learning (level-2), and how these outcomes are affected by characteristics of the teacher and classroom (level-3).

Many cross-sectional studies in education also use the three-level hierarchical structure (Raudenbush and Bryk 2002:4). Nye, Hedges, and Konstantopoulos (2000) examined data from the Tennessee class size experiment wherein students were nested within classrooms within schools. They showed that class size has a significant negative effect on student performance across schools that should be considered by educational policy makers. Regardless of the type of student or school, small classes appeared to have a beneficial effect. In another three-level study, which entailed students nested within schools within states, Raudenbush, Fotiu, and Cheong (1999) analyzed state-to-state variation in math achievement. They found significant heterogeneity in math achievement across states, but were able to account for most of the heterogeneity by means of variables based on characteristics of students, teachers, and schools.

Although hierarchical structures appeared in a considerable number of earlier studies in the social sciences, they were frequently mismanaged in the data analysis (Raudenbush and Bryk 2002:5). Much of this "neglect has reflected limitations in conventional statistical techniques for the estimation of linear models with nested structures" (Raudenbush and Bryk 2002:5). According to Raudenbush and Bryk (2002:5), "these limitations have generated concerns about aggregation bias, misestimated precision, and the 'unit of analysis' problem." Further, they have cultivated a general misconception about multilevel models that has deterred researchers from entertaining hypotheses concerning cross-level effects.

In past studies, the two most common procedures used erroneously to examine hierarchical structure involved disaggregation and aggregation. The first procedure is to disaggregate all the contextual-level variables down to the level of the individuals. In the case of my dissertation, which examines the effects of metropolitan characteristics on the likelihood of being intermarried, this would involve assigning the characteristics of the metropolitan areas to the individual women. I would then continue with my analysis at the individual level using logistic regression. The trouble with this approach is that women from the same metropolitan area will have the same values on the metropolitan characteristics. Therefore, I cannot "use the assumption of independence of observations that is basic for the use of classic statistical techniques" (de Leeuw 1992:xiv; cited by Poston and Duan 2001:13) because women are not randomly assigned to metropolitan areas.

The other approach is "to aggregate the individual-level characteristics up to the contextual level and to conduct the analysis at the aggregate level" (Poston and Duan 2001:13). In the case of my dissertation, I would aggregate, that is, average, the women characteristics on interracial marriage (yes/no), educational attainment, occupational status, and income up to the metropolitan level of analysis and then proceed with an OLS analysis among metropolitan areas. The major drawback to this approach is that I would then be excluding all the within-group (within-metropolitan area) variation, which could mean losing as much as 80 to 90 percent of the variation in my sample before my analysis even begins. Poston and Duan (2001:13) caution that "information is frequently wasted, and, moreover, the interpretation of the results could be distorted, if not fallacious, if we endeavored to interpret the aggregate relationship at the individual level" (see also de Leeuw 1992:xiv).

Although problems with data analysis were once pervasive, "the barriers to use an explicit hierarchical modeling framework have now been removed" (Raudenbush and Bryk 2002:5). Statistical procedures now permit researchers to ask questions about individual-and contextual-level effects and interactions, as well as measure the extent of variation at each level. Following the logic of Raudenbush and Byrk (2002), I will use the term hierarchical linear models (HLM) to refer to these methods, but they are often referred to by other names, such as *multilevel linear models* (sociology), *mixed-effects models* and *random-effects models* (biometry), *random-coefficient regression models* (econometrics), and *covariance components models* (statistics) (Raudenbush and Bryk 2002:5).

The hierarchical linear model (HLM) is suitable "for two- and three-level nested data where (a) the expected outcome at each level may be represented as a linear function of the regression coefficients and (b) the random effects at each level can reasonably be assumed normally distributed" (Raudenbush and Bryk 2002:291). Because my dependent variable is binary, as opposed to being continuous, the standard HLM is inappropriate for three reasons (Raudenbush and Bryk 2002:292):

> 1. There are no restrictions on the predicted values of the level-1 outcome in the standard HLM. They can legitimately take on any real value. In contrast, the predicted value of a binary outcome Y, if viewed as the probability that Y = 1, must lie in the interval (0, 1). This constraint gives meaning to the effect sizes defined by the model. A nonlinear transformation of the predicted value, such as a logit or probit transformation, will satisfy this constraint.

> 2. Given the predicted value of the outcome, the level-1 random effect can take on only one of two values and, therefore, cannot be normally distributed.

> 3. The level-1 random effect cannot have homogeneous variance. Instead, the variance of this random effect depends on the predicted value.

Accordingly, I will be using a "hierarchical generalized linear model" (HGLM) (Raudenbush and Bryk 2002:291) to determine the likelihood of intermarriage for white and black metropolitan females. HGLMs provide a sound framework for modeling multilevel data with dichotomous outcomes and nonnormally distributed errors. HGLM will allow me to assess the degree to which the individual characteristics of the women, as well as the contextual characteristics of their metropolitan areas, influence their likelihood of being intermarried.

Just as is the situation with HLM, HGLM is basically a regression of regressions (see Poston and Duan 2001:14). I will first perform a sequence of separate logit regressions of the likelihood of white and black metropolitan females being intermarried, one regression for each of the metropolitan areas. These regressions will be the level-1, or within-metro area, models. The intercepts and coefficients from the level-1 models will then be employed as the dependent variables in a series of equations across the metropolitan areas; these will be the level-2, or between-metro area, models (see Poston and Duan 2001:14). This approach will allow me to examine the effects of the level-1 and level-2 variables on the odds of being in an interracial marriage, in addition to the effects of the level-2 variables on the level-1 slopes. The HGLM application yields "approximate empirical Bayes estimates of the randomly varying level-1 coefficients, generalized least squares estimators of the level-2 coefficients, and approximate restricted maximum-likelihood estimators of the variance and covariance parameters" (Bryk et al. 1996:128; cited by Poston and Duan 2001:14).

While there are many similarities between the nonlinear HGLM analysis and HLM, there are some noteworthy differences. Firstly, "the standard HLM uses a normal sampling model and an identity link function, [where] the binary outcome model uses a binomial sampling model and logit link" (Raudenbush and Bryk 2002:294-95). The particular sampling model I will be using is known as the Bernoulli distribution.

Another distinction rests in the iterative process. The HGLM application is doubly iterative, so the user must identify a maximum number of macro and micro iterations. Owing to the longer iterative process, HGLM models sometimes take more

time to converge than the standard HLM equations. Bryk and Raudenbush (1992)

explain that the convergence criterion for the macro iterations governs the precision of

the parameter estimates. The convergence criterion for the micro iterations governs how

many micro iterations there will be per macro iteration. On account of the HGLM

default specifications, macro iterations will end when the greatest parameter estimate

change is under 10^{-4}. Likewise, micro iterations within macro iterations will end when

the conditional log likelihood changes by less than 10^{-5}.

To illustrate the HGLM strategy for this dissertation, I will now introduce and

discuss a hypothetical model predicting the odds of intermarriage for black and white

metropolitan women. In the level-1 model, n_{ij} is the logit of being intermarried, that is,

the predicted log-odds of success. It is being predicted by the woman's education

(EDUC), Duncan Socioeconomic Index score (SEI), and annual income (INCOME). In

the level-2 model, each of the level-1 coefficients is predicted by the percentage

Republican voters (REP) and the rate of partnered gay men (GAY) in the metropolitan

area.

The level-1 structural model, utilizing the logit link[8], is as follows:

$$n_{ij} = log \ [\ \phi_{ij} \ / \ 1 \ - \ \phi_{ij} \ ] = \beta_{0j} + \beta_{1j} (EDUC)_{ij} + \beta_{2j} \ (SEI)_{ij} + \beta_{3j} \ (INCOME)_{ij}$$

The level-2 structural model is as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \ (REP) + \gamma_{02} \ (GAY) + u_{oj}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \ (REP) + \gamma_{12} \ (GAY) + u_{1j}$$

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[8] Following Raudenbush and Bryk (2002:295), "n_{ij} is the log of the odds of success. If the probability of success, ϕ_{ij}, is .5, the odds of success $\phi_{ij} / (1 - \phi_{ij}) = .5 / .5 = 1.0$ and the log-odds or 'logit' is log (1) = 0. When the probability of success is less than .5, the odds are less than 1.0 and the logit is negative. When the probability is greater than .5, the odds are greater than 1.0 and the logit is positive."

$$\beta_{2j} = \gamma_{20} + \gamma_{21} \, (\textbf{REP}) + \gamma_{22} \, (\textbf{GAY}) + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + \gamma_{31} \, (\textbf{REP}) + \gamma_{32} \, (\textbf{GAY}) + u_{3j}$$

FIGURE 1
Contextual-Effect Models
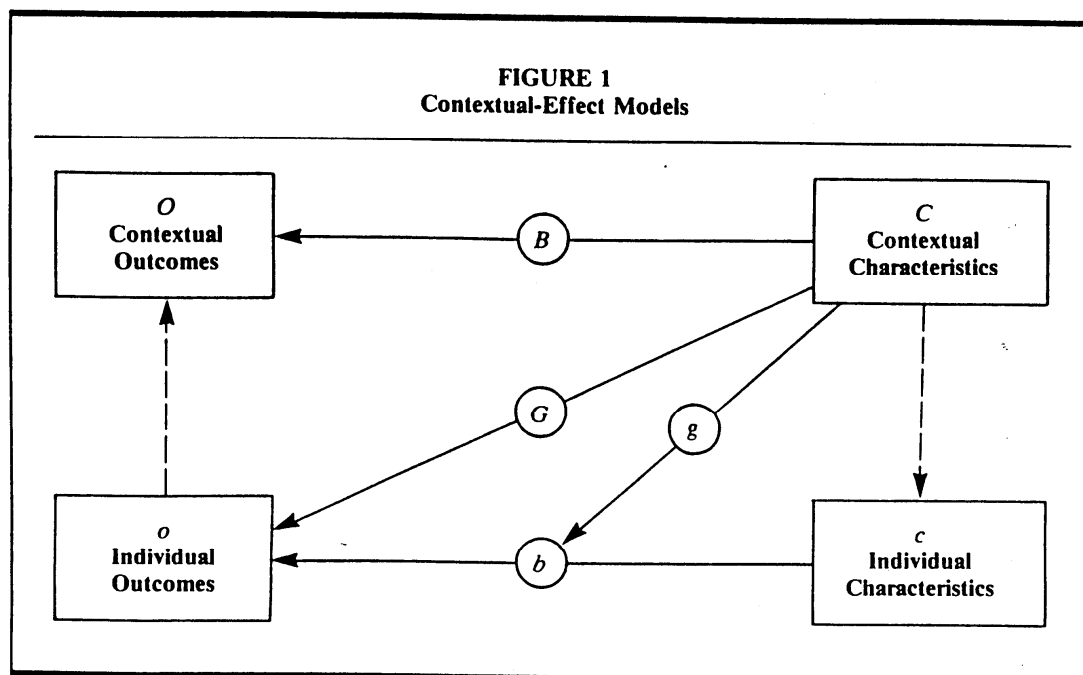
Figure 1[9] provides an illustration of the various potential connections between contexts and individuals (Anderton and Sellers 1989:107), making it an ideal tool for discussing the abovementioned HGLM model. Regarding the individual-level variables, I hypothesize that the higher the educational attainment, SEI score, and income of the woman, the greater her likelihood of being interracially married. The level-1 effects of the individual characteristics, *c*, on the individual outcomes, *o*, are represented in the solid line, *b*. With respect to the contextual-level variables, I hypothesize that the higher the percentage of Republican voters in a metropolitan area, the lower the prevalence of

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[9] Figure 1 is from the Douglas L. Anderton and Deborah E. Sellers article "A Brief Review of Contextual-Effect Models and Measurement."

intermarried partners. Conversely, I hypothesize that the higher the rate of partnered gay men, the higher the prevalence of intermarried partners. The main level-2 effects of the contextual characteristics, C, on the individual outcomes, o, are represented in the solid line, G.

Beyond the direct effects of the level-1 and level-2 variables, HGLM permits hypotheses regarding the indirect effects of context on individual behavior. For instance, I might hypothesize that the positive relationship between education and intermarriage is stronger in liberal metro areas than in conservative metro areas. I would thus be "hypothesizing that the context affects (through g) the nature of the individual-level relationship (b) rather than directly affecting (through G) individual outcomes (o)" (Anderton and Sellers 1989:109). According to Anderton and Sellers (1989:109), "this alternative approach would seem to more nearly resemble theoretical discussions of context," which typically treat contexts as environments that house individual-level relationships. In the discussion of my results, these effects will be referred to as cross-level interactions. To illustrate, one cross-level interaction may involve the GAY variable on the EDUC variable and intermarriage. If this effect is positive and significant, it will indicate that the greater the rate of partnered gay men in a metropolitan area, the stronger the slope (relationship) between educational attainment and intermarriage.

As stated by Anderton and Sellers (1989:114), "we are confronted daily with the evidence that individuals are not entirely separable from their environs. They are shaped, constrained, and compelled by the complex interrelationships in which they find

themselves." It is for this reason that I will use multilevel modeling to explore black-white interracial marriage. My goal will be to ascertain whether, and to what extent context should be included in our explanations of intermarriage in a way that is both theoretically meaningful and methodologically accurate.

The next chapter of my dissertation presents the results and interpretations of my individual-level logistic regression models. A later chapter estimates and presents the results of the multi-level logistic models.

CHAPTER IV

LEVEL ONE ANALYSES AND RESULTS

In this chapter, six logistic regression equations are estimated to test the efficacy

of three prominent micro-level theories of interracial marriage: status-caste exchange,

status homogamy, and educational/economic success. First, I review the hypotheses

associated with each of these theories, along with the operationalization of the specific

variables to be used in the corresponding logistic models. Second, I provide a statistical

description of the dependent variable and seven independent variables for white and

black metropolitan women. Third, I discuss the diagnostic strategies that were used for

each of the models. And finally, I present and discuss the results of the six logistic

regression equations.

In this analysis, I am not attempting to develop a comprehensive model of

interracial marriage. Instead, I hope to see which types of variables have an effect on the

incidence of intermarriage and which do not, and of those that do, which are/is the most

important.

Hypotheses and Operationalization

Status-caste exchange theory is examined in Models 1 and 2 for white and black

women, respectively. Supporters of this theory contend that black-white marriages are

an exchange of high class status on the part of the black spouse for high caste status on

the part of the white spouse. In large part, exchange theory was developed to explain the

significant gender disparities in black-white marriage rates. However, recent research

has endorsed its assumptions irrespective of spouses' gender (see Kalmijn 1993; Qian

1997). Although previous studies have relied mainly on log-linear models of educational categories to examine status-caste exchange theory, I use logistic regression here to be able to incorporate interval measures of economic status and educational attainment; the log-linear models reduced these data into a few categories, thus losing not only some of their meaning but also possible explanatory power.

As already discussed in Chapter III, two independent variables are employed to assess the utility of status-caste exchange theory in predicting the odds of being in an interracial marriage: the husband/wife Duncan SEI ratio, and the husband/wife education ratio. The husband/wife Duncan SEI ratio is constructed using the Duncan Socioeconomic Index (SEI) score, which quantifies occupational status according to the income level and educational attainment associated with each occupation. The SEI score ranges from a minimum value of 0 for persons who are not in the labor force and do not report a past occupation to a maximum value of 96. To produce ratios, I divided the husband's SEI score by the wife's SEI score. Therefore, ratios above 1 indicate the husband has a higher SEI score than the wife. Thousands of individuals were unemployed, and thus received SEI scores of 0. So to be able to retain these individuals in my analysis, a slight adjustment was made to the ratio calculation that does not change the abovementioned interpretation[10].

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[10] I first examined the SEI ratios without the "zero" cases to determine minimum and maximum ratio scores. Using Stata, I reloaded the complete dataset and replaced the SEI ratio with an extreme high score if the wife's SEI was 0, and an extreme low score if the husband's SEI was 0. This strategy was deemed superior to dropping the "zero" cases, as doing so would violate the premise of status-caste exchange theory.

The second independent variable in the status-caste exchange models is the husband/wife education ratio, which is constructed with the educational attainment recode variable (EDUCREC). The EDUCREC variable ranges from a minimum of 1 for persons with no education or preschool education to a high of 16 for persons with 4+ years of college. To produce education ratios, I divided the husband's educational attainment by the wife's. Therefore, higher ratios indicate higher educational achievement for the husband. Because individuals with no education received a score of 1, the education ratio did not require the adjustment that was needed for the SEI ratio.

Status-caste exchange theory predicts that among intermarried couples, black spouses will have higher SES than white spouses. If the theory is correct, the above independent variables should have a positive association with the odds of intermarriage for white females and a negative association for black females. Specifically, intermarried white women should have less educational attainment and occupational status than their husbands, while intermarried black women should have more.

Status homogamy theory is examined in Models 3 and 4 for white and black women, respectively. According to status homogamy theory, interracial spouses will have comparable levels of socioeconomic status and educational attainment. The notion is that every person seeks the most affluent spouse with the greatest earning potential. The aspiration of every person to find the most auspicious partner gives rise to homogamy, as the most prosperous man and woman marry each other, and the second-most prosperous man and woman marry each other, and so forth. Beyond profit maximization, it is also posited that people tend to pursue partners "with whom they

have a strong personal affinity" (Rosenfeld 2005:1294) and who generally resemble themselves on SES attributes.

Two independent variables are used to test the predictions made by status homogamy theory: homogamy SEI and homogamy education. I developed each of these variables by taking the absolute value of the difference between the husband and the wife's scores on SEI and on educational attainment. The higher values on these two variables, the greater the difference between partners in SES. Status homogamy theory predicts that spouses will have similar levels of SES. Therefore, the homogamy SEI and homogamy education variables should both be negatively associated with the odds of being intermarried for both groups of women.

Educational/economic success theory is examined in Models 5 and 6 for white and black women, respectively. As the name suggests, this theory argues that people with higher levels of educational attainment and economic status will be more likely to participate in an interracial marriage than those with lower levels of SES. Please note that the name "educational/economic success" is my own personal neologism and is not used as such in the literature dealing with interracial marriage. I selected this term because it best reflects the combined tenets of structural assimilation and isolation theory, as well as findings from studies unrelated to either of these established theories. Remember that structural assimilation theory expects a positive relationship between SES and intermarriage for blacks and whites, while isolation theory expects this relationship only for blacks and assumes no association, positive or negative, for whites.

If my results dictate an independent appraisal of these theories, such a discussion will be provided.

Three independent variables will be included in my educational/economic success models: wife's SEI, wife's education, and wife's income. As mentioned earlier, the education variable ranges from 1 to 16, while the SEI variable ranges from 0 to 96. The income variable reflects the woman's total pre-tax wage and salary income for the previous year. Sources of income consist of wages, salaries, commissions, cash bonuses, tips, and any other money income accepted from an employer. Incomes above $200,000 are "Top coded" using the state mean of all cases greater than or equal to the Top code state minimum value (usa.ipums.org). Higher levels of SES should lead to higher odds of intermarriage for black and white females; thus, I anticipate all three of these variables to have a positive relationship with intermarriage. Specifically, I hypothesize that women with high values on educational attainment, occupational status, and income will have higher odds of being in an interracial marriage than women with low values on these variables.

Descriptive Statistics

A brief discussion of descriptive statistics will now be provided for white and black women residing in the metropolitan areas of the United States in 2006 (see Tables 1 and 2 below). For both groups, the sample was restricted to women who reported non-Hispanic ethnicity, were married with spouse present, and resided in a metropolitan

area[11]. Further, women residing in metropolitan areas containing less than 100 sample cases were excluded. This was done to maintain consistency with the multi-level analyses to be presented in Chapter V, which require at least 100 cases per metropolitan area.

The sample for white women (Table 1) is comprised of 317,255 cases, while the sample for black women (Table 2), 21,764 cases[12]. The minimum and maximum values are presented for the dependent variable, intermarriage, as well as each of the independent variables. As explained earlier, intermarriage is a dummy variable, scored 1 (maximum) if the woman is intermarried and 0 (minimum) if she is not intermarried. The mean of intermarriage for white women is 0.0079 (SE = 0.0002), and the mean for black women is 0.0283 (SE = 0.0013). Just under 1 percent of the white women have black husbands, and 2.8 percent of the black women have white husbands.

The two independent variables examining status-caste exchange theory, i.e., the h/w SEI ratio and the h/w education ratio, equal 1 if the husband and wife have the same scores on SEI and education, are greater than 1 if the husband has higher scores, and are less than 1 if the wife has higher scores. For both groups of women, the mean of the h/w SEI ratio is greater than 1, indicating that, on average, husbands have higher occupational status than their wives. However, the mean of the h/w education ratio is 1.03 for white women and 1.02 for black women, signifying that, on average, metropolitan spouses have very similar levels of education.

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[11] According to ipums.org, "a metropolitan area (whether an SMA, SMSA, MSA, or a PMSA) is an area consisting of a large population center and adjacent communities (usually counties) that have a high degree of economic and social interaction with that center. Metropolitan areas often cross state lines…and may contain more than one central city."

[12] On account of diagnostic measures, the number of cases varies among the eight logistic models.

The two independent variables examining status homogamy theory, i.e., homogamy SEI and homogamy education, represent the absolute difference between the husband's and wife's scores on SEI and educational attainment. SEI scores range from 0 to 96 and levels of education range from 1 to 16. Because many spouses are unemployed and receive a score of 0 on SEI, the maximum difference between spouses' scores on SEI is 96. Likewise, the maximum difference between spouses' years of education is 15 since some spouses have no education or only attended preschool. The mean of homogamy SEI is 24.18 for white women and 23.32 for black women. As discussed above, there is little difference between spouses in years of education; the mean of homogamy education is 1.23 and 1.46 for white and black women, respectively.

The means on SEI, education, and income are very similar for white and black metropolitan women. On average, white women have an SEI score of 39.62, while black women have a score of 38.61. The average level of education for both groups of women is approximately 1.5 years of college. With regard to income, black women have a higher mean income ($24,472.74) than white women ($22,442.60). Conversely, white women have a higher maximum value on income ($648,994) than black women ($563,468). The next section of this chapter will review the logistic regression diagnostics I used when developing my models.

TABLE 1 Descriptive Statistics of White Women Residing in Metropolitan Areas, 2006 N = 317,255				
Dependent Variable	Minimum	Maximum	Mean	Linearized SE
Intermarriage (1=yes, 0=no)	0	1	0.0079	0.0002
Independent Variables	Minimum	Maximum	Mean	Linearized SE
H/W SEI Ratio	0.03	20.10	3.71	0.0138
H/W Education Ratio	0.06	16.00	1.03	0.0009
Homogamy SEI	0.00	96.00	24.18	0.0462
Homogamy Education	0.00	15.00	1.23	0.0033
Wife's SEI	0.00	96.00	39.62	0.0580
Wife's Education	1.00	16.00	13.84	0.0042
Wife's Income	0.00	648,994	22,442.60	68.1061

TABLE 2 Descriptive Statistics of Black Women Residing in Metropolitan Areas, 2006 N = 21,764				
Dependent Variable	Minimum	Maximum	Mean	Linearized SE
Intermarriage (1=yes, 0=no)	0	1	0.0283	0.0013
Independent Variables	Minimum	Maximum	Mean	Linearized SE
H/W SEI Ratio	0.04	20.10	2.89	0.0475
H/W Education Ratio	0.06	16.00	1.02	0.0044
Homogamy SEI	0.00	96.00	23.32	0.1637
Homogamy Education	0.00	15.00	1.46	0.0142
Wife's SEI	0.00	96.00	38.61	0.2140
Wife's Education	1.00	16.00	13.45	0.0176
Wife's Income	0.00	563,468	24,472.74	216.66

Logistic Regression Diagnostics

A series of logit diagnostics were performed for each of the six individual-level models discussed above, i.e., three for white metropolitan women and three for black metropolitan women. In the paragraphs that follow, I address the diagnostics and subsequent judgments for each model in detail.

Model 1 examines status-caste exchange theory for white women and includes two independent variables, the husband/wife Duncan SEI ratio and the husband/wife education ratio. My first diagnostic inspection is for multicollinearity. After examining the zero-order correlation between my two independent variables, I checked their tolerance values in the model. As suggested in Chapter III, tolerance values under 0.35 are cause for concern. This model had no collinearity problem; the tolerance value for both variables is 0.99.

The second diagnostic procedure is a test of non-normality. In logistic regression it is not assumed that the errors are normally distributed. Instead, it is assumed that the errors follow a binomial distribution, which approximates a normal distribution in large samples. To check for non-normality, I calculated a standardized Pearson residual for this model. Normal distributions have a skewness value of 0 and a kurtosis value of 3. In this model, the distribution is skewed left, the skew value exceeds 0.8 in absolute value, and the plot of the residuals shows an obviously non-normal distribution. This finding will be taken into consideration as I resume the diagnostics. Non-normality is acceptable provided that no outlying covariate patterns have a significant impact on the model.

The final diagnostic issue I attend to is influence. I calculated Pregibon's ΔB_j (known as dBeta), which is comparable to the Cook's D model diagnostic in OLS regression, to determine if there are any outlying covariate patterns in my model. As described in Chapter III, Pregibon's ΔB_j measures the change in the estimated logistic

parameters that results from eliminating all observations with the jth X pattern[13]

(Hamilton 1992:236). I determined that this model contains one covariate pattern with a

ΔB_j of 9.79, which is significantly higher than the cut-off value of 1. Remarkably,

24,124 women are in this extreme covariate group, which have values on the SEI ratio

and education ratio of 0.03 and 1, respectively. To ascertain whether these cases have

excessive influence on the logistic equation, I re-estimated the logit equation without

these women. The coefficients, statistical inferences, and goodness-of-fit test showed

inconsequential change. Although the residuals are left skewed and there is one outlying

covariate pattern, the diagnostics do not create sufficient concern to merit re-

specification of Model 1.

Model 2 appraises status-caste exchange theory for black women, and its

independent variables are identical to those in Model 1. The same series of diagnostics

were undertaken, beginning with a check for multicollinearity. The zero-order

correlation between the two independent variables is low and their tolerance value is

0.99, dismissing any concerns of collinearity. The residuals in this model closely

approximate a normal distribution; the skew value is only 0.03 and the plot of the

residuals boasts a normal appearance. The Pregibon's ΔB_j statistic uncovered one

covariate pattern with a ΔB_j of 1.82. There are 1,426 women in this outlying covariate

group, which have values on the SEI ratio and education ratio of 0.04 and 1,

respectively. The results did not change appreciably after excluding cases in this

covariate pattern. Thus, Model 2 is accepted in its original state.

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[13] Following Hamilton (1992:235-36), the Pregibon's ΔB_j statistic is:
$$\Delta B_j = r^2_j h_j / (1 - h_j)^2$$

Model 3 examines status homogamy theory for white women and includes two independent variables, homogamy SEI and homogamy education. Resembling Models 1 and 2, the tolerance value for the two independent variables is a high 0.99, indicating the model does not have any collinearity problems. The plot of the residuals shows a relatively normal distribution and the skewness and kurtosis values are low at –0.75 and 2.82. The Pregibon's ΔB_j statistic revealed three covariate patterns with ΔB_j's greater than 1. Two of these outlying patterns have reasonably low ΔB_j's, but one has a ΔB_j of 10.02. Even more noteworthy, the most extreme covariate group contains 31,338 women. In examining the pattern for this group, I learned that the women have values of 0 on both homogamy SEI and homogamy education. When I re-estimated the model without these cases, the coefficients and statistical inferences changed markedly.

Because it would be very unusual for a husband and wife to have identical occupational index scores (SEI's), as well as years of education, I decided to investigate these cases further by looking at individual households with this covariate pattern. I discovered that 17,464 households contained husbands and wives with scores of 0 on SEI. The ACS coding instructions assign a SEI of zero to persons who are not in the labor force and to persons who are in the labor force, but fail to report a specific occupation. Thus, I have no way of knowing whether these zeros represent missing data or instances of unemployment. The remaining 13,874 households consisted of couples with legitimately identical scores on SEI and education. I decided to retain these households in Model 3 but to exclude the 17,464 with two scores of zero on SEI. This re-specified model is presented in the results section.

Model 4 evaluates status homogamy theory for black women, and its independent variables are the same as those in Model 3. This model showed no signs of collinearity, as the tolerance value for the two independent variables is 0.99. The plot of the residuals indicates close to a normal distribution, and the skewness value is low at 0.65. Although the kurtosis value is a bit high at 4.18, it does not warrant concern since the skew value is below the cutoff of 0.8. The Pregibon's ΔB_j statistic did not uncover any outlying covariate patterns in this model. In light of the problems in Model 3, however, I decided to exclude the 2,061 households that contained husbands and wives with scores of 0 on SEI. The coefficients and statistical inferences in the re-specified model are more consistent with the theoretical expectations of status homogamy theory. On account of this finding, I chose to use the re-specified model in the results section.

Model 5 appraises educational/economic success theory for white women and includes three independent variables, namely, wife's education, wife's SEI, and wife's income. The tolerance values for the three independent variables are all well above the cutoff value of 0.35; thus, multicollinearity is not a problem in this model. Indeed, the lowest tolerance value is 0.72 for the SEI variable. The standardized Pearson residual was calculated, revealing an error distribution that approximates normality. In this model, the distribution is slightly skewed left and the skew value is -0.91, not much higher than the cutoff of 0.8. The kurtosis value is 4.12, and the plot of the residuals exhibits a reasonably normal distribution.

Notably, the Pregibon's ΔB_j statistic detected three covariate patterns with ΔB_j's greater than 1. One of these outlying patterns has a rather low ΔB_j of 1.52, but the other

two have extremely high ΔB_j's of 9.87 and 22.63. Altogether, the three covariate groups

contain 74,562 women, the majority of which fall into the most extreme ΔB_j pattern.

Interestingly, the women in all three groups have values of 0 on both SEI and income.

Their values on education are 12 (ΔB_j of 22.63), 16 (ΔB_j of 9.87), and 14 (ΔB_j of 1.52).

When I re-estimated the model without these cases, the coefficients and statistical

inferences were not as supportive of educational/economic success theory as those in the

original model. The effect of SEI on intermarriage became negative, the effect of

income weakened, and the Pseudo R^2 statistic declined. Although the coefficient of

education became positive after dropping the outliers, the effect was insignificant.

Given these findings, I decided not to use the re-specified model in the results section.

Rather, Model 5 is presented in its original state.

Model 6 examines educational/economic success theory for black women, and its

independent variables are the same as those in Model 5. The tolerance values signify no

multicollinearity concerns; the SEI variable has the lowest tolerance value of 0.64. The

skewness and kurtosis values for the error distribution are significantly higher than those

in a normal distribution at 2.16 and 11.46, respectively. The plot of the residuals also

shows the distribution is right skewed. However, the Pregibon's ΔB_j statistic did not

find any covariate patterns in the model with a ΔB_j greater than 1. These diagnostics do

not necessitate my re-specification of Model 6.

Owing to the diagnostic findings in Models 3 and 4, I have decided to present in

the results section both the original and re-specified equations of status-caste exchange

theory for both black and white women. Models 1 and 2 are the equations in their

original state, as described in earlier paragraphs. Models 1A and 2A, however, exclude

the couples with matching scores of 0 on SEI. None of the coefficients or statistical

inferences change in these re-specified models. Still, given the construction of the

husband/wife SEI ratios, I found it important to present both sets of results.

Logistic Regression Results

Model 1 (Table 3) appraises status-caste exchange theory for white women and

contains two independent variables: h/w SEI ratio and h/w education ratio. A total of

317,267 households are included in Model 1. As discussed earlier, status-caste exchange

theory contends that in interracial marriages the black spouse's socioeconomic status is

exchanged for the white spouse's racial caste status. Accordingly, the h/w SEI ratio and

h/w education ratio are expected to have a positive relationship with the odds of white

women being intermarried. The Model 1 results do not lend support to this theory. Only

one of the two independent variables has a significant effect and its effect is in the

opposite direction. Contrary to the expectations of status-caste exchange theory, each

additional increase in the h/w SEI ratio decreases the odds of being intermarried by 3.29

percent, other things equal.

TABLE 3 Logistic Regression Results: Status-Caste Exchange Theory White Women Residing in Metropolitan Areas, Model 1, 2006 N=317,267			
Model 1	Odds Ratio	b _Linearized SE_	t, p>0
H/W SEI Ratio	0.9671*	-0.0335 _0.0049_	-6.89, 0.000
H/W Education Ratio	1.0061	0.0062 _0.0589_	0.10, 0.917
Constant		-4.7425 _0.0671_	-70.68, 0.000
McKelvey-Zavonia R^2	0.015		
*Values significant at 0.05 or above			

Model 2 (Table 4) examines status-caste exchange theory for black women and contains the same independent variables as Model 1. A total of 21,768 households are included in Model 2. The predictions for Model 2 are opposite those of Model 1, that is, the h/w SEI ratio and h/w education ratio are expected to have a negative relationship with the odds of black women being intermarried. Resembling Model 1, Model 2 has only one significant effect, which conflicts with the assumptions of exchange theory. For each additional increase in the h/w education ratio, the odds of being intermarried increase by 8.67 percent, other things equal.

TABLE 4 Logistic Regression Results: Status-Caste Exchange Theory Black Women Residing in Metropolitan Areas, Model 2, 2006 N=21,768			
Model 2	Odds Ratio	b *Linearized SE*	t, p>0
H/W SEI Ratio	1.0094	0.0094 *0.0073*	1.29, 0.199
H/W Education Ratio	1.0867*	0.0832 *0.0325*	2.56, 0.010
Constant		-3.6512 *0.0615*	-59.33, 0.000
McKelvey-Zavonia R^2	0.002		
*Values significant at 0.05 or above			

Models 1A (Table 5) and 2A (Table 6) are analogous to Models 1 and 2 in their
independent variables and predicted effects. Their distinction rests in the several
thousand cases that were excluded because of their scores of zero on SEI for both
spouses. In Model 1A, 38,436 observations were removed, resulting in a total of
278,841 households. In Model 2A, 2,061 observations were removed, resulting in a total
of 19,707 households.

The results of Model 1A are comparable to those of Model 1. The h/w education
ratio does not have a significant effect on the probability of a white woman being
intermarried, while the h/w SEI ratio has a significant negative effect. For each
additional increase in the h/w SEI ratio, the odds of being intermarried decrease by 4.24
percent, all else equal.

The results of Model 2A correspond to those of Model 2. The h/w SEI ratio does
not have a significant effect on the odds of a black woman being intermarried, while the

h/w education ratio has a significant positive effect. Each additional increase in the h/w

education ratio increases the odds of being intermarried by 8.76 percent, all else equal.

TABLE 5 Logistic Regression Results: Status-Caste Exchange Theory White Women Residing in Metropolitan Areas, Model 1A, 2006 N=278,841			
Model 1A	Odds Ratio	b *Linearized SE*	t, p>0
H/W SEI Ratio	0.9576*	-0.0434 *0.0052*	-8.31, 0.000
H/W Education Ratio	1.0049	0.0049 *0.0627*	0.08, 0.938
Constant		-4.6057 *0.0704*	-65.47, 0.000
McKelvey-Zavonia R^2	0.027		
*Values significant at 0.05 or above			

TABLE 6 Logistic Regression Results: Status-Caste Exchange Theory Black Women Residing in Metropolitan Areas, Model 2A, 2006 N=19,707			
Model 2A	Odds Ratio	b *Linearized SE*	t, p>0
H/W SEI Ratio	1.0034	0.0034 *0.0075*	0.45, 0.651
H/W Education Ratio	1.0876*	0.0840 *0.0327*	2.57, 0.010
Constant		-3.5587 *0.0623*	-57.09, 0.000
McKelvey-Zavonia R^2	0.002		
*Values significant at 0.05 or above			

In brief, the findings of Models 1, 2, 1A, and 2A do not substantiate the claims of

status-caste exchange theory for black or white metropolitan women.

Model 3 (Table 7) evaluates status homogamy theory for white women and consists of two independent variables: homogamy SEI and homogamy education. A total of 278,841 households are included in Model 3. As explained in the diagnostics section, 38,426 households were removed from Model 3 (and Model 1A) for having scores of zero on SEI for both spouses. These extreme cases were found to have a significant impact on the model; thus, only the results for the re-specified model are presented here.

The prediction of status homogamy theory is that interracial spouses will have similar levels of SES. In keeping with this prediction, the homogamy SEI and homogamy education variables are expected to be negatively associated with the odds of being intermarried for both white and black women. Model 3 provides inconsistent support for this theory for white women. The effect of homogamy SEI on intermarriage is negative and significant ($\Omega = 0.9946$), while the effect of homogamy education is positive and significant ($\Omega = 1.0320$). The latter finding is unexpected, especially in light of previous research suggesting that interracial spouses possess similar levels of education.

TABLE 7 Logistic Regression Results: Status Homogamy Theory White Women Residing in Metropolitan Areas, Model 3, 2006 N=278,841			
Model 3	Odds Ratio	b *Linearized SE*	t, p>0
Homogamy SEI	0.9946*	-0.0054 *0.0012*	-4.63, 0.000
Homogamy Education	1.0320*	0.0315 *0.0149*	2.11, 0.035
Constant		-4.6409 *0.0423*	-109.62, 0.000
McKelvey-Zavonia R^2	0.006		
*Values significant at 0.05 or above			

Model 4 (Table 8) appraises status homogamy theory for black women and contains the same independent variables as Model 3. A total of 2,061 households were excluded from Model 4 (and Model 2A) for having duplicate scores of zero on SEI. In its re-specified form, Model 4 includes 19,707 households. According to status homogamy theory, homogamy SEI and homogamy education should be negatively related to the likelihood of being intermarried for black women. However, neither of these effects is significant.

TABLE 8 Logistic Regression Results: Status Homogamy Theory Black Women Residing in Metropolitan Areas, Model 4, 2006 N=19,707			
Model 4	Odds Ratio	b *Linearized SE*	t, p>0
Homogamy SEI	1.0011	0.0011 *0.0025*	0.45, 0.653
Homogamy Education	0.9754	-0.0249 *0.0251*	-0.99, 0.321
Constant		-3.4547 *0.0854*	-40.44, 0.000
McKelvey-Zavonia R^2	0.000		
*Values significant at 0.05 or above			

In summary, Models 3 and 4 lend partial support to the claims of status homogamy theory as it relates to white women, but no support as it relates to black women.

Model 5 (Table 9) examines educational/economic success theory for white women and contains three independent variables: wife's SEI, wife's education, and wife's income. A total of 317,255 households are included in Model 5. As explained earlier, educational/economic success theory contends that people with higher levels of SES will be more likely to marry interracially than people with lower levels of SES. Thus, all three of these independent variables are expected to have a positive relationship with the odds of white and black women being intermarried. Two of the three predictors, i.e., wife's SEI and wife's income, have the expected positive association with intermarriage. For each unit increase in occupational status (SEI), other things equal, the odds of being intermarried increase by .74 percent. Moreover, increasing

annual income increases a woman's probability of being intermarried. Contrary to my

hypothesis, the effect of education was negative and significant.

TABLE 9 Logistic Regression Results: Educational/Economic Success Theory White Women Residing in Metropolitan Areas, Model 5, 2006 N=317,255			
Model 5	Odds Ratio	b *Linearized SE*	t, p>0
Wife's SEI	1.0074*	0.0074 *0.0010*	7.38, 0.000
Wife's Education	0.9401*	-0.0618 *0.0119*	-5.21, 0.000
Wife's Income	1.0000*	1.67e-06 *4.32e-07*	3.86, 0.000
Constant		-4.3384 *0.1533*	-28.30, 0.000
McKelvey-Zavonia R^2	0.018		
*Values significant at 0.05 or above			

Model 6 (Table 10) evaluates educational/economic success theory for black

women and contains the same independent variables as Model 5. A total of 21,764

households are included in Model 6. The predictions for Model 6 are the same as those

for Model 5, that is, I hypothesize a positive effect for all three independent variables.

The results of Model 6 provide support for educational/economic success theory. All

three effects are positive and two are significant. For every additional increase in level

of education, other things equal, the odds of being intermarried increase by 5.64 percent.

Additionally, each unit increase in occupational status (SEI) increases the odds of being

intermarried by .59 percent. While not quite significant, wife's income is associated

with intermarriage in the hypothesized positive direction.

TABLE 10 Logistic Regression Results: Educational/Economic Success Theory Black Women Residing in Metropolitan Areas, Model 6, 2006 N=21,764			
Model 6	Odds Ratio	b *Linearized SE*	t, p>0
Wife's SEI	1.0059*	0.0059 *0.0022*	2.64, 0.008
Wife's Education	1.0564*	0.0549 *0.0260*	2.11, 0.035
Wife's Income	1.0000	2.72e-06 *1.96e-06*	1.39, 0.166
Constant		-4.6064 *0.3279*	-14.05, 0.000
McKelvey-Zavonia R^2 0.033			
*Values significant at 0.05 or above			

In brief, Models 5 and 6 do support the assumptions of educational/economic success theory for both black and white metropolitan women.

Conclusion

This chapter examined statistically the three prominent micro-level theories of interracial marriage for black and white women: status-caste exchange, status homogamy, and educational/economic success. Again, my intention was not to develop a comprehensive model to explain the incidence of intermarriage. Rather, my main goal was to see which of the predictors had an effect on the incidence of intermarriage and which predictors seemed to be the most important. Status-caste exchange theory was accorded no support from this exercise. Each of the exchange models (Models 1, 2, 1A, and 2A) had only one significant effect, and it was in the unpredicted direction each time. Status homogamy theory had inconsistent support from Model 3 and no support from Model 4. Ultimately, educational/economic success theory received the greatest

endorsement from this investigation. Each of the models (Models 5 and 6) contained

two independent variables with significant effects in the expected direction. These

findings will be taken into account as I develop my multi-level logistic models in the

next chapter.

CHAPTER V

MULTILEVEL ANALYSES AND RESULTS

In this chapter, I engage in multilevel analyses of the log odds of women being in interracial marriages. Multilevel analysis allows the researcher to introduce explanatory variables from the residential contexts in which the women are located. It permits one to consider not only the degree to which personal characteristics influence the log odds of interracial marriage, but also the degree to which characteristics of their residential areas do so. This should result in a fuller understanding of why women engage or not engage in interracial marriage that is possible by relying only on explanatory variables of the women themselves.

Four hierarchical generalized linear models (HGLMs) are estimated to evaluate the likelihood of intermarriage for white and black women living in metropolitan areas. I explore the extent to which the characteristics of the women themselves, along with the contextual characteristics of their metropolitan areas, impact their probability of being interracially married. Before attending to the results, I first discuss the hypotheses associated with each of these models, operationalize the independent variables, and provide a statistical description of the level-2 (i.e. contextual) variables.

Hypotheses and Operationalization

In Chapter IV, the educational/economic success variables (see especially Models 5 and 6) had the most consistent effects on the incidence of intermarriage for both black and white metropolitan women. Given this finding, these predictors are used as the level-1 variables in the two-tiered hierarchical generalized linear models

(HGLMs) presented in this chapter. Various contextual predictors, measuring conservative or liberal representation at the metropolitan level, are used as the level-2 variables. In all of the multilevel models, I am treating the slopes as fixed, primarily because my theoretical reasoning focuses only on the direct effects of the level-2 variables[14]. While identical logistic equations were estimated for white and black women in Chapter IV, the HGLMs in this chapter are different for each group of women. This incongruity is due to several factors, the main one being that certain level-1 variables prevented the white models from converging during the iterative process of the HGLM application[15]. Additionally, the level-2 variables did not perform in a uniformly satisfactory way in the white and black models[16]. Thus, different contextual variables are used in each of the equations. In the following paragraphs, I will address the specific combinations of individual- and contextual-level variables used in each model along with the associated hypotheses.

Model 7 examines the direct effects of one level-1 variable, wife's SEI, and one level-2 variable, the gay household rate, on the odds of white women being interracially married. As explained in Chapter IV, the SEI score is a measure of occupational status that is based on the income level and educational attainment associated with each occupation. In accordance with the tenets of educational/economic success theory, I

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[14] Besides being more theoretically sound, holding the slopes as fixed was required for the HGLM application to function properly. When I treated the slopes as random, the HGLM application never converged during the iterative process of any of the models I ran. This is likely due to insufficient variance in the level-1 variables among the metropolitan areas.

[15] At level-1, wife's income and wife's education prevented the white models from converging.

[16] At level-2, the Republican and Baptist variables did not have the hypothesized effect on intermarriage for white women. Thus, other level-2 variables, i.e. the gay household rate and the lesbian household rate, are used in their place.

predict a positive association between wife's SEI and intermarriage. Specifically, I hypothesize that women with a high value on occupational status (SEI) will have higher log odds of being in an interracial marriage than women with a low value on this variable.

The gay household rate reflects the number of partnered male households per 1,000 coupled households. Prior research has suggested that interracial couples and same-sex couples face similar types of discrimination, thus motivating them to live in liberal metropolitan areas. Thus, I expect there to be a positive relationship between the gay household rate and intermarriage. Specifically, I hypothesize that women living in metropolitan areas with a high gay household rate will have higher log odds of being intermarried. Again, both of my hypotheses concern the direct effects of the level-1 and level-2 independent variables on intermarriage. I do not have any hypotheses regarding the cross-level interactions of the gay household rate on the slope of wife's SEI and intermarriage. Accordingly, in this model and the one to follow, I am holding the slopes as fixed.

Model 8 considers the direct effects of one level-1 variable, wife's SEI, and one level-2 variable, the lesbian household rate, on the odds of intermarriage for white women. As mentioned above, wife's SEI is expected to have a positive relationship with intermarriage. Analogous to the gay household rate, the lesbian household rate reflects the number of partnered lesbian households per 1,000 coupled households. Because interracial and same-sex couples are more geographically mobile than other couples and tend to be drawn to the same types of environments, I predict a positive association

between the lesbian household rate and intermarriage. Specifically, I hypothesize that women residing in metropolitan areas with a high lesbian household rate will have higher log odds of being intermarried.

Model 9 explores the direct effects of three level-1 variables, namely, wife's income, wife's SEI, and wife's education, and two level-2 variables, percentage Republican and the gay household rate, on the log odds of black women being interracially married. Educational/economic success theory predicts a positive association between SES and intermarriage. Therefore, I hypothesize that women with high values on income, SEI, and education will have higher log odds of being in an interracial marriage than women with low values on these variables.

The Republican variable measures the percentage of votes cast in the 1996 presidential election for the Republican candidate, Robert Dole. Previous studies have discovered a connection between individuals' political affiliation and their position on interracial marriage. In general, Republicans and ideological conservatives tend to have more adverse opinions toward intermarriage than their liberal counterparts (see Golebiowska 2007; Johnson 2004). Thus, I expect to find a negative relationship between the percentage Republican and intermarriage. Specifically, I hypothesize that women living in metropolitan areas with a high percentage Republican will have average lower log odds of being intermarried. As in the white models, the gay household rate is hypothesized to have a positive relationship with intermarriage for black women. All of my hypotheses relate to the direct effects of the level-1 and level-2 independent variables

on intermarriage. For that reason, in this model and the one to follow, and as previously discussed, I am treating the slopes as fixed, not as random.

Model 10 examines the direct effects of three level-1 variables, wife's income, wife's SEI, and wife's education, and two level-2 variables, the Baptist adherent rate and the gay household rate, on the log odds of intermarriage for black women. As explained above, all three of the level-1 variables are expected to have a positive relationship with intermarriage. The Baptist adherent rate is the number of Southern Baptist members per 100,000 population in 2000. Resembling the percentage Republican variable, the Baptist adherent rate should be indicative of the extent of conservative representation among the metropolitan areas. Prior research suggests that individuals with conservative religious beliefs tend to hold more negative opinions of intermarriage. Thus I expect there to be a negative relationship between the Baptist adherent rate and intermarriage. Specifically, I hypothesize that women living in metropolitan areas with a high Baptist adherent rate will have lower log odds of being intermarried than their counterparts residing in metropolitan areas with low Baptist rates. As justified in the preceding paragraphs, the gay household rate is hypothesized to have a positive association with intermarriage.

Descriptive Statistics of Contextual Variables

A short discussion of descriptive statistics will now be provided for the contextual, or level-2, variables used in the white and black models (see Tables 11 and 12 below). For both analyses, metropolitan areas containing less than 100 sample cases (households) were excluded from the sample.

The sample for the white models (Table 11) includes 280 metropolitan areas. The two contextual variables used in Models 7 and 8 are the gay household rate and the lesbian household rate. The mean of the gay household rate is 4.26, ranging from a minimum of 1.70 in Provo-Orem, Utah to a maximum of 16.18 in San Francisco-Oakland-Vallejo, California. This signifies that, on average, there are 4.26 gay households for every 1,000 coupled households among the 280 metropolitan areas in 2000. The mean of the lesbian household rate is 4.68, ranging from a minimum of 1.99 in Wausau, Wisconsin to a maximum of 12.53 in Santa Rosa-Petaluma, California. This indicates that, on average, there are 4.68 lesbian households for every 1,000 coupled households among the 280 metropolitan areas in 2000.

TABLE 11 Descriptive Statistics of Level-2 Variables: White Models Metropolitan Areas, 2000 N = 280				
Independent Variables	Mean	SD	Minimum	Maximum
Gay Household Rate	4.26	1.57	1.70	16.18
Lesbian Household Rate	4.68	1.59	1.99	12.53

The sample for the black models (Table 12) includes 58 metropolitan areas. The three contextual variables used in Models 9 and 10 are the gay household rate, the percentage Republican, and the Baptist adherent rate. The mean of the gay household rate is 5.54, denoting that, on average, there are 5.54 gay households for every 1,000 coupled households among the 58 metropolitan areas in 2000. The gay household rate varies from a low of 3.02 in Buffalo-Niagara Falls, New York to a high of 16.18 in San Francisco-Oakland-Vallejo, California. The mean of percentage Republican is 43.08, indicating that, on average, 43.08 percent of voters in the 1996 presidential election

voted for the Republican candidate, Robert Dole, among these 58 metropolitan areas.

This variable ranges from a low of 26.23 in San Francisco-Oakland-Vallejo, California

to a high of 56.20 in Greenville-Spartanburg-Anderson, South Carolina. The mean of

the Baptist adherent rate is 10,439.64, spanning from a low of 120.16 in New York-

Northeastern New Jersey to a maximum of 34,449.28 in Greenville-Spartanburg-

Anderson, South Carolina. The mean denotes an average of 10,439 Southern Baptist

members per 100,000 people among the 58 metropolitan areas in 2000.

TABLE 12 Descriptive Statistics of Level-2 Variables: Black Models Metropolitan Areas, 2000 N = 58				
Independent Variables	Mean	SD	Minimum	Maximum
Gay Household Rate	5.54	2.12	3.02	16.18
Percentage Republican	43.08	7.82	26.23	56.20
Baptist Adherent Rate	10,439.64	9,365.99	120.16	34,449.28

Multilevel Results

One-way ANOVA Models

When conducting a hierarchical linear analysis, it is useful to first estimate a one-

way ANOVA model to ensure that multi-level modeling is warranted. The one-way

ANOVA model is referred to as *fully unconditional* since no independent variables are

specified at either level. This model generates a point estimate and confidence interval

for the grand mean, γ_{00} (Raudenbush and Bryk 2002:24). "More important, it provides

information about the outcome variability at each of the two levels" (Raudenbush and

Bryk 2002:24). In other words, it allows one to ascertain how much variation in the

dependent variable occurs within-groups and how much occurs between-groups by providing the intra-class correlation.

The intra-class correlation, that is, the ratio of level-2 variance to the total variation, is a helpful index for standard two-tiered hierarchical linear models. However, Raudenbush and Bryk (2002:298) caution that "this measure is less informative in the case of nonlinear link functions, because the level-1 variance is now heteroscedastic." Snijders and Bosker (1999) suggest an alternative estimate of intra-class correlation for binomial models that develops from understanding the level-1 model in terms of a latent variable $Z_{ij} = \eta_{ij} + r_{ij}$ (Raudenbush and Bryk 2002:334). Using this conceptualization, the intra-class correlation can be calculated as $\rho = \tau_{00}/(\tau_{00} + \pi^2/3)$, where τ_{00} is the level-2 variance component and $\pi^2/3$ is the level-1 variance component and is a constant. As explained by Raudenbush and Bryk (2002:334), "this conception of ρ depends on the choice of η_{ij} as the logit link and the assumption that a latent r_{ij} follows the logistic distribution."

Tables 13 and 14 display the one-way ANOVA models for the Bernoulli non-linear multilevel models with the white (Table 13) and black (Table 14) data, with no independent variables present. The two hierarchical generalized linear models indicate that most of the variation in intermarriage occurs at the individual level, i.e., within metropolitan areas. However, there is a statistically significant proportion of variance in the dependent variable between the metropolitan areas, that is, at level-2. Specifically, 6.1 percent of the variance in intermarriage occurs between metropolitan areas, and 93.9

percent of the variance in intermarriage occurs at the individual level, i.e., within

metropolitan areas, for both white and black women.

TABLE 13: One-way ANOVA Model for Bernoulli Non-linear Multilevel Model: White Data			
τ_{00}	P-value	$(\tau_{00} + \pi^2/3)$	$\tau_{00}/(\tau_{00} + \pi^2/3)$
0.21362	0.000	3.503488134	6.1%

TABLE 14: One-way ANOVA Model for Bernoulli Non-linear Multilevel Model: Black Data			
τ_{00}	P-value	$(\tau_{00} + \pi^2/3)$	$\tau_{00}/(\tau_{00} + \pi^2/3)$
0.21265	0.000	3.502518134	6.1%

Multilevel Models

Tables 15 through 18 display the results of the HGLM analyses for the two

groups of women. In the succeeding paragraphs, I will provide an interpretation of each

of the γ_{xx} (gamma) coefficients from these models. I will interpret the γ_{xx} coefficients as

I did the logistic regression coefficients in Chapter IV, by converting them into odds

ratios. Remember that I am holding the slopes as fixed in all of the multilevel models.

Therefore, my analyses will only be addressing the direct effects of the level-1 and level-

2 variables.

Model 7 (Table 15) explores the impacts of one level-1 variable, wife's SEI, and

one level-2 variable, the gay household rate, on intermarriage for white women. A total

of 316, 553 households and 280 metropolitan areas are included in Model 7.

The γ_{00} coefficient is -5.129, t = -124.3. This is the intercept and is the grand

mean of the log-odds of the probability of being interracially married for women with

zeros on the independent variables. I can convert it into a "predicted probability" using the formula, $1 / (1 + \exp \{- \text{predicted log-odds coefficient}\})$. The predicted probability of being intermarried for white metropolitan women is 0.006 (that is, 0.6 percent), and is very significant. Because the level-1 predictor has been centered around its group mean and the level-2 predictor around its grand mean, this probability of being intermarried relates to women with an average score on the SEI variable, who reside in metropolitan areas with a mean score on the gay household rate variable; because the independent variables have been centered, these means are actually the equivalent of zero scores on the independent variables.

The γ_{01} coefficient is 0.084, t = 4.414. This is the main effect of the level-2 variable, gay household rate, on the mean intermarriage rate of the metropolitan areas. I hypothesized a positive relationship between this variable and intermarriage. Indeed, the effect is positive and significant. The higher the gay household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among white women. Specifically, for every increase in a metropolitan area's gay household rate, the metropolitan area's average expected odds of white women being intermarried would increase by 8.8 percent, all else equal.

The γ_{10} coefficient is 0.007, t = 10.482. This is the main effect of wife's SEI on the probability of being intermarried. Supporting my level-1 hypothesis, the effect is positive and significant. The greater the wife's SEI score, the greater the likelihood of being intermarried. For every increase in wife's SEI score, the odds of being intermarried increase by 0.7 percent, other things equal.

TABLE 15 Effects (Gamma Coefficients) with Robust Standard Errors, Individual and Metropolitan Characteristics on the Likelihood of Being Intermarried: 316,553 White Women Residents of United States in 280 Metropolitan Areas, Model 7, 2006			
Model 7			
Fixed Effect	Coefficient SE	Odds Ratio	t, p>0
Intercept γ_{00}	-5.129* 0.041	0.006	-124.284, 0.000
Gay Household Rate γ_{01}	0.084* 0.019	1.088	4.414, 0.000
For Wife's SEI slope			
Intercept γ_{10}	0.007* 0.001	1.007	10.482, 0.000
*Values significant at 0.05 or above			

Model 8 (Table 16) examines the effect of one level-1 variable, wife's SEI, and one level-2 variable, the lesbian household rate, on intermarriage for white women. A total of 316,553 households and 280 metropolitan areas are included in Model 8.

The γ_{00} coefficient is -5.112, t = -128.9. As I explained above, this is the intercept and is the grand mean of the log-odds of the probability of being interracially married. The predicted probability of being intermarried for white metropolitan women is 0.006 (0.6 percent), and is highly significant. This probability of being intermarried refers to woman with an average score on the SEI variable, who reside in metropolitan areas with a mean score on the lesbian household rate variable.

The γ_{01} coefficient is 0.085, t = 4.556. This is the main effect of the level-2 variable, the lesbian household rate, on the mean intermarriage rate of the metropolitan areas. I had hypothesized that this effect should be positive, and the results support my expectations. The higher the lesbian household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among white women.

Specifically, for every increase in a metropolitan area's lesbian household rate, the

metropolitan area's average expected odds of women being intermarried would increase

by 8.9 percent, all else equal.

The γ_{10} coefficient is 0.007, t = 10.014. This is the main effect of wife's SEI on

the probability of being intermarried. In keeping with my level-1 hypothesis, this effect

is positive and significant. For every increase in wife's SEI score, the odds of being

intermarried increase by 0.7 percent, other things equal.

TABLE 16 Effects (Gamma Coefficients) with Robust Standard Errors, Individual and Metropolitan Characteristics on the Likelihood of Being Intermarried: 316,553 White Women Residents of United States in 280 Metropolitan Areas, Model 8, 2006			
Model 8			
Fixed Effect	Coefficient SE	Odds Ratio	t, p>0
Intercept γ_{00}	-5.112* 0.040	0.006	-128.958, 0.000
Lesbian Household Rate γ_{01}	0.085* 0.019	1.089	4.556, 0.000
For Wife's SEI slope			
Intercept γ_{10}	0.007* 0.001	1.007	10.014, 0.000
*Values significant at 0.05 or above			

Model 9 (Table 17) explores the effects of three level-1 variables: wife's income,

wife's SEI, and wife's education, and two level-2 variables: percentage republican and

the gay household rate, on intermarriage for black women. A total of 21,764 households

and 58 metropolitan areas are included in Model 9.

The γ_{00} coefficient is –3.538, t = -52.18. This is the intercept and is the grand

mean of the log-odds of the probability of being interracially married. As explained

above, I can convert it into a "predicted probability" using the formula, $1 / (1 + \exp \{-$

predicted log-odds coefficient}). The predicted probability of being intermarried for black metropolitan women is 0.028 (that is, 2.8 percent) and is very significant. Because the level-1 and level-2 predictors have been centered around their means, this probability of being intermarried relates to women with average scores on the income, SEI, and education variables, who reside in metropolitan areas with mean scores on percentage Republican and the gay household rate variables.

The γ_{01} coefficient is -0.015, t = -1.812. This is the main effect of the level-2 variable, percentage Republican, on the mean intermarriage rate of the metropolitan areas. I hypothesized a negative relationship between this variable and intermarriage. It is negative, but not quite significant in the two-tailed t-test.

The γ_{02} coefficient is 0.075, t = 3.125. This is the main effect of the level-2 variable, gay household rate, on the mean intermarriage rate of the metropolitan areas. Supporting my level-2 hypothesis, the effect is positive and significant. The higher the gay household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among black women. Specifically, for every increase in a metropolitan area's gay household rate, the metropolitan area's average expected odds of black women being intermarried would increase by 7.8 percent, all else equal.

The γ_{10} coefficient is 0.000002, t = 1.991. This is the main effect of wife's income on the probability of being intermarried. In keeping with my level-1 hypothesis, the effect is positive and significant. The greater the wife's income, the greater the likelihood of being intermarried.

The γ_{20} coefficient is 0.007, t = 5.062. This is the main effect of wife's SEI on the probability of being intermarried. I hypothesized that this effect should be positive. It is indeed positive and significant. The greater the wife's SEI score, the greater the likelihood of being intermarried. Specifically, every increase in wife's SEI score increases the odds of being intermarried by 0.7 percent, other things equal.

The γ_{30} coefficient is 0.058, t = 2.560. This is the main effect of wife's education on the probability of being intermarried. Supporting my level-1 hypothesis, the effect is positive and significant. The greater the wife's education, the greater the probability of being intermarried. For every increase in wife's level of education, the odds of being intermarried increase by 6 percent, all else equal.

TABLE 17 Effects (Gamma Coefficients) with Robust Standard Errors, Individual and Metropolitan Characteristics on the Likelihood of Being Intermarried: 21,764 Black Women Residents of United States in 58 Metropolitan Areas, Model 9, 2006			
Model 9			
Fixed Effect	Coefficient *SE*	Odds Ratio	t, p>0
Intercept γ_{00}	-3.538* *0.068*	0.029	-52.180, 0.000
Percentage Republican γ_{01}	-0.015 *0.008*	0.985	-1.812, 0.075
Gay Household Rate γ_{02}	0.075* *0.024*	1.078	3.125, 0.003
For Wife's Income slope			
Intercept γ_{10}	0.000002* *0.000001*	1.000002	1.991, 0.046
For Wife's SEI slope			
Intercept γ_{20}	0.007* *0.001*	1.007	5.062, 0.000
For Wife's Education slope			
Intercept γ_{30}	0.058* *0.023*	1.060	2.560, 0.011
*Values significant at 0.05 or above			

Model 10 (Table 18) examines the direct effects of three level-1 variables: wife's income, wife's SEI, and wife's education, and the direct effects of two level-2 variables: the Baptist adherent rate and the gay household rate, on intermarriage for black women. A total of 21,764 households and 58 metropolitan areas are included in Model 10.

The γ_{00} coefficient is -3.611, t = -63.943. This is the intercept and the grand mean of the log-odds of the probability of being intermarried. The predicted probability of being intermarried for black metropolitan women is 0.026 (that is, 2.6 percent) and is highly significant. Because the level-1 and level-2 predictors have been centered around their means, this probability of being intermarried refers to women with average scores on the income, SEI, and education variables, who reside in metropolitan areas with mean scores on the Baptist adherent rate and the gay household rate variables.

The γ_{01} coefficient is -0.000041, t = -5.055. This is the main effect of the level-2 variable, Baptist adherent rate, on the mean intermarriage rate of the metropolitan areas for black women. I hypothesized a negative relationship between this variable and intermarriage. It is indeed negative and significant. The greater the Baptist adherent rate of a metropolitan area, the less the likelihood of being interracially married.

The γ_{02} coefficient is 0.050, t = 2.747. This is the main effect of the level-2 variable, gay household rate, on the mean intermarriage rate of the metropolitan areas. In keeping with my level-2 hypothesis, the effect is positive and significant. For every increase in a metropolitan area's gay household rate, the metropolitan area's average

expected odds of black women being intermarried would increase by 5.1 percent, other things equal.

The γ_{10} coefficient is 0.000002, t = 1.954. This is the main effect of wife's income on the probability of being interracially married. Supporting my level-1 hypothesis, the effect is positive and significant. The greater the wife's income, the greater the likelihood of being intermarried.

The γ_{20} coefficient is 0.007, t = 4.954. This is the main effect of wife's SEI on the probability of being intermarried. I hypothesized that this effect should be positive. Indeed, the effect is positive and significant. For every increase in wife's SEI score, the odds of being intermarried increase by 7 percent, all else equal.

The γ_{30} coefficient is 0.058, t = 2.497. This is the main effect of wife's education on the probability of being intermarried. In support of my level-1 hypothesis, the effect is positive and significant. For every increase in wife's level of education, the odds of being intermarried increase by 6 percent, other things equal.

TABLE 18 Effects (Gamma Coefficients) with Robust Standard Errors, Individual and Metropolitan Characteristics on the Likelihood of Being Intermarried: 21,764 Black Women Residents of United States in 58 Metropolitan Areas, Model 10, 2006			
Model 10			
Fixed Effect	Coefficient *SE*	Odds Ratio	t, p>0
Intercept γ_{00}	-3.612* *0.056*	0.027	-63.943, 0.000
Baptist Adherent Rate γ_{01}	-0.000041* *0.000008*	0.999959	-5.055, 0.000
Gay Household Rate γ_{02}	0.050* *0.018*	1.050	2.747, 0.009
For Wife's Income slope			
Intercept γ_{10}	0.000002* *0.000001*	1.000002	1.954, 0.050
For Wife's SEI slope			
Intercept γ_{20}	0.007* *0.001*	1.007	4.954, 0.000
For Wife's Education slope			
Intercept γ_{30}	0.058* *0.023*	1.060	2.497, 0.013
*Values significant at 0.05 or above			

Summary of Modeling Results

This chapter employed hierarchical generalized linear models (HGLMs) to perform multilevel analyses of the likelihood of intermarriage for white and black metropolitan women. My goal was to assess how the individual-level characteristics of the women, as well as the contextual-level characteristics of their metropolitan areas impacted their likelihood of being intermarried. Models 7 and 8 (Tables 15 and 16) showed that the level-1 predictor of wife's SEI, and the level-2 predictors of the gay and lesbian household rates have positive effects on the odds of intermarriage for white women. Models 9 and 10 (Tables 17 and 18) demonstrated that the level-1 predictors of

wife's income, SEI, and education and the level-2 predictors of the gay household rate

and the Baptist adherent rate have positive effects on intermarriage for black women.

Continued Discussion

In Chapter II, I discussed a general plan that could be used to evaluate Blau's

social structural theorems of intergroup contact. My objective was to augment prior

findings (see Blau and Schwartz 1984; Blau et al. 1982; Blau et al. 1984; South and

Messner 1986; see also Cready and Saenz 1997:338) with the 2006 ACS data, and to

ascertain the extent to which relative minority size, racial/ethnic heterogeneity, status

inequality, and segregation influenced the rate of intermarriage among white and black

metropolitan females. To perform such an investigation, I intended to estimate another

series of multi-level logistic models that would constitute Chapter VI of this dissertation.

Regretfully, I have discovered several major conditions that argue against my

conducting the analysis of the Blau hypotheses.

First and foremost, to test Blau's theories, one really needs to know where the

couples were married, not where they are presently residing. Unfortunately, the ACS

does not ask such a question. In previous studies, researchers handled this problem by

restricting their analyses to individuals aged 20-29 who had not migrated in the last five

years. Because most men and women get married in their mid-to-late twenties, and thus

are unlikely to have wedded in a different location prior to the five years, this was a

reasonable approximation of nuptial location. However, the ACS is conducted annually

and only has information on whether the person changed residence in the last year. This

variable, called MIGRATE1, asks individuals age 1 and over if they lived in the "same house" (non-movers) or a "different house" (movers) one year earlier (usa.ipums.org).

An assumption of nuptial location based on MIGRATE1 would really be questionable, in my view, for two main reasons. To begin with, even the detailed version of this variable only distinguishes between movers, non-movers, and those living abroad one year ago. The variable provides no information about whether the moves (aside from those abroad) occurred within the metropolitan area, within the county, within the state, between metropolitan areas, between counties, or between states. By excluding all movers, I could only be certain that those who were living abroad were not living in the current metropolitan area the previous year. Among the other movers, I would have no way of knowing which geographical boundary, if any, the women crossed. As a result, I would be excluding many women who moved within the metropolitan area—precisely the women required to conduct the Blau analysis.

According to a census report, most American moves are local moves made within the same county (Hansen n.d.). For example, 42 million American moves occurred in the period between March 1992 and March 1993, and 26 million (61.9 percent) of these moves were within the county. This type of residential mobility is extremely common when people are in their twenties, as young adults undergo various transitions associated with changes in education, employment, and relationships. Compared with the annual mobility rate of 16.8 percent for all persons 1 year old and over, 35.8 percent of persons 20 to 24 years old and 30.9 percent of persons 25 to 29 years old moved between 1992 and 1993 (Hansen n.d.). According to the U.S. Census

Bureau, "about three-quarters of young, single, and college-educated adults reported moving between 1995 and 2000, including nearly 80 percent of those living in central cities in 2000 [and]…regardless of location of current residence, a plurality of [their] moves…tended to be intracounty" (U.S. Census Bureau 2003b). To provide some personal testimony, at age 28 I myself have had seven different addresses over the course of my stay in the Bryan-College Station, Texas metropolitan area (one dorm room, one apartment, three duplexes, and two houses).

The second problem is that the one-year migration variable provides little assurance that the non-movers wedded in their current location since it is such a short period of time. To illustrate, I would be assuming that women aged 20-29 living in the Bryan-College Station, Texas metropolitan area who did not move in the last year were married in that metropolitan area. This is a weak assumption, given that residential mobility is highest for persons in their 20s, who are leaving their parents' homes to attend college, obtain jobs, get married, and build families (Population Reference Bureau 2001:1-8). Again using myself as an example, I would have been retained in the analysis for being a non-mover, even though a year and a half ago I was living and was married in a different area of the state. Unfortunately, I cannot circumvent this problem by linking several ACS samples together, since a housing unit address is only eligible to be sampled one time over a five-year period.

To strengthen the plausibility of nuptial location for non-movers, I could include a second restriction based on birthplace. Conceivably, women who did not move in the last year and who were also born in their current metropolitan area are more likely to

have wedded in that location than non-movers who were born elsewhere. The setback is that the ACS only has information on the U.S. state, the outlying U.S. area or territory, or the foreign country where the person was born (usa.ipums.org). The survey has no variable about the specific metropolitan area or county of birthplace. Accordingly, my strategy would be to restrict the sample to non-movers who were born in the state of their current residence. All women whose birthplaces do not correspond to their current state FIPS (Federal Information Processing Standards) codes would be removed from the sample.

The assumption behind this restriction is that the non-movers who were born in the state of their current residence were married in their current metropolitan area. This supposition of nuptial location is more plausible when applied to these individuals than it would be to non-movers born in a different state. Still, it is problematic for obvious reasons. Young adults have the highest mobility rates of any other age group, "perhaps because they are less risk-averse and have a longer time horizon to recoup an 'investment' in migration" (U.S. Census Bureau 2003b). They may move for reasons concerning their education, employment preferences, or romantic attachments, or they may move because they desire a set of amenities offered in another apartment or in another city. In view of these facts, the notion that a woman was married in the Los Angeles-Long Beach metropolitan area because she has lived there for one year and is a native Californian seems far-fetched. This assumption becomes even more strained when considering locations where a large proportion of the population was born in another state or country, such as the New York-Northeastern New Jersey metropolitan

area. Moreover, a restriction based on birthplace seems to encroach on Blau's theorems, which are in no way limited to, nor intended for, an exclusively indigenous population.

If I were to I accept the inherent problems discussed above and restrict my analyses to native-born non-movers aged 20 to 29, I would be left with an incomplete, and likely uninformative, set of results. Recall from an earlier chapter my stipulation (well accepted in the statistical literature – see below) that a metropolitan area must have at least 100 cases to be included in a multilevel model. With regard to the black women sample, once I exclude all women who are not in the age group 20 to 29, as well as those who lived in a different house one year earlier (movers), there are only two metropolitan areas remaining with over 100 cases (i.e. Atlanta, Georgia: 103 cases; New York-Northeastern New Jersey: 102 cases). If I further restrict the black sample to non-movers aged 20 to 29 who were born in the state of their current residence, there are no metropolitan areas with over 100 cases. While small samples are somewhat acceptable in the situation of completely balanced data[17], they threaten the validity of inferences when dealing with unbalanced data as seen here (Raudenbush and Bryk 2002:280). As Raudenbush and Bryk (2002:281) explain, "in the unbalanced case, the standard error estimates for the fixed effects are generally too small, and hypothesis tests based on the unit normal reference distribution will be too liberal" if sample size is inadequate. Given our reliance on large-sample theory, even if I were to forgo the second restriction based on birthplace, two metropolitan areas are insufficient to carry out the black analysis.

[17] According to Raudenbush and Bryk (2002:287), "in a two-level hierarchy, the following conditions must hold for the data to be completely balanced: (a) Sample sizes within units must be equal, (b) The same set of level-1 predictor values must be present within each unit, (c) For each of the Q + 1 level-2 equations, the same set of predictor variables must be used, and (d) Level-1 and level-2 variance components must be constant for every unit."

With regard to the white sample, if I remove all women who are not aged 20 to 29, in addition to those who lived in a different house one year earlier (movers), there are 42 metropolitan areas remaining with over 100 cases. If I further restrict the sample to those who were born in the state of their current residence, there are only 21 metropolitan areas remaining with over 100 cases. Such small samples would be permissible in situations where there is adequate variation in the dependent and independent variables. However, in situations where variation is minimal across the level-2 units, small samples exacerbate preexisting problems.

As seen in the multilevel results presented earlier in this chapter, the white models necessitated a different combination of independent variables than did the black models because there is less variation in the white data. Owing to the greater variation in the black data, each equation was successfully estimated with three level-1 variables and two level-2 variables. In contrast, the white data tolerated just one level-1 variable and one level-2 variable in each of the equations. When I attempted to use additional level-1 and/or level-2 variables in my white analysis, the models would not converge during the iterative process of the HGLM application. Moreover, inadequate variation in the level-1 variables required that I hold the slopes as fixed in all of the multilevel models. When I treated the slopes as random, none of the HLGM applications for either set of data would converge. While lacking variation caused problems for both the white and black analyses, the problems plaguing the white data were much more severe.

The abovementioned white models estimated earlier in this chapter contained 316,553 households and 280 metropolitan areas (each with over 100 cases). Even with

such ample numbers of level-1 and level-2 units in the hierarchical structure, wife's SEI was the only permissible level-1 variable for convergence. Given these findings, I strongly anticipate the Blau analysis would be rendered inestimable because there would not be enough cases to support the invariable white data. As seen below in Table 19, the Blau analysis would contain a total of 3,611 households (level-1 units) and 21 metropolitan areas (level-2 units). This extreme reduction in sample size poses a problem for two main reasons: (1) there are very few intermarried white women within each of the metropolitan areas, and (2) there is very little variation in intermarriage across the 21 metropolitan areas. The number of intermarried cases ranges from a low of 0 in Riverside-San Bernadino, California to a high of 5 in Minneapolis-St. Paul, Minnesota. The remaining areas each contain 1 to 3 intermarried white women.

TABLE 19 Descriptive Statistics of Intermarriage for White Women Residing in 21 Restricted Metropolitan Areas, 2006 N = 3,611			
Intermarriage	0 = no	1 = yes	Total
Metropolitan areas			
Atlanta, GA	180	3	183
Baltimore, MD	107	2	109
Boston, MA-NH	127	1	128
Chicago, IL	281	3	284
Cincinnati-Hamilton, OH/KY/IN	102	1	103
Cleveland, OH	119	1	120
Columbus, OH	132	3	135
Dallas-Fort Worth, TX	273	2	275
Detroit, MI	195	2	197
Grand Rapids, MI	105	2	107
Houston-Brazoria, TX	164	2	166
Indianapolis, IN	142	1	143
Los Angeles-Long Beach, CA	163	2	165
Minneapolis-St. Paul, MN	156	5	161
New York-Northeastern NJ	383	2	385
Philadelphia, PA/NJ	184	3	187
Phoenix, AZ	101	1	102
Pittsburgh, PA	171	3	174
Riverside-San Bernadino, CA	119	0	119
St. Louis, MO-IL	172	3	175
Salt Lake City-Ogden, UT	192	1	193
Total	3,568	43	3,611

Many factors advise against the Blau analysis. To begin with, I do not have

information on where the couples were married and must rely instead on an inexact

approximation of nuptial location. While previous studies effectively managed this

problem with an age restriction and a five-year migration variable, the ACS data only

have a one-year migration variable that does not distinguish between residential mobility

and true migrations. Consequently, restricting my sample to non-movers would mean

discarding numerous individuals who should be included in the Blau analysis for having

never left their current metropolitan area. My assumption regarding the nuptial location

of non-movers would also be weak, given the extremely short one-year migration

interval. The average American moves approximately 11 times in life and averages

about 7 years between moves (Population Reference Bureau 2001:1-8). The fact that

most of these moves occur between the late teens and early thirties makes MIGRATE1 a

poor candidate for inferences of nuptial location. To improve the credibility of nuptial

location for non-movers, I could incorporate a second restriction based on birthplace.

However, this assumption would also be imperfect, as the ACS does not contain

birthplace information below the level of the state. Beyond these commonsensical

shortcomings, there are also major statistical factors discouraging the Blau analysis.

Firstly, the various data restrictions decrease the black sample to such an extent that

there are insufficient cases to conduct the analysis for black women. I would only be

able to perform an admittedly imperfect analysis for white women that would likely

result in inestimable models because of insufficient variation in the white data. In light

of these considerations, I conclude that the Blau analysis will need to be conducted at a

later date with a different data source and possibly a different statistical approach. In the

next chapter, I will discuss the conclusions and implications of the research conducted

and reported in this dissertation.

CHAPTER VI

CONCLUSIONS AND FUTURE RESEARCH

There were three main objectives for this dissertation. The first was to evaluate statistically the three principal micro-level theories of interracial marriage. The second was to employ multilevel modeling to explore the impacts of various individual-and contextual-level characteristics on the probability of being interracially married. The third was to assess Blau's social structural theorems of intergroup contact. I accomplished two of these three objectives. In this final chapter, I will summarize my research and findings, recognize what I could have done differently, and address my future research agenda in this broad area of interracial marriage.

Summary of Results

Level One Analyses

My first set of analyses, presented in Chapter IV, tested the efficacy of three prominent micro-level theories of interracial marriage: status-caste exchange, status homogamy, and educational/economic success. A brief review of these theories will be provided, followed by a discussion of my results. I will conclude this section by addressing the faults in my investigation, and offer suggestions for how these problems could have been more effectively managed.

The famed sociologists Kingsley Davis and Robert Merton introduced status-caste exchange theory nearly seventy years ago, and it is still a prevailing theory of interracial marriage today. Davis's (1941) and Merton's (1941) articles were entirely theoretical, so the empirical support for status-caste exchange theory is based on more

recent research. The basic argument is that black-white marriages are an exchange of high class status on the part of the black spouse for high caste status on the part of the white spouse. Although exchange theory originated out of efforts to explain the gender disparities in black-white marriage rates, recent studies have upheld its assumptions irrespective of spouses' gender (see Kalmijn 1993; Qian 1997).

The major adversary of status-caste exchange theory is status homogamy theory, which proposes that interracial spouses will have comparable levels of SES. The argument is that every person searches for the most affluent spouse with the greatest earning potential. The desire of every person to find the most qualified partner results in homogamy, as the most successful man and woman marry each other, and the second-most successful man and woman marry each other, and so forth. In addition to profit maximization, supporters of status homogamy theory also maintain that people are inclined to pursue partners "with whom they have a strong personal affinity" (Rosenfeld 2005:1294; see also Buston and Emlen 2003) and who are like themselves with respect to SES.

Educational/economic success theory contends that people with higher levels of educational and economic status will be more likely to engage in an interracial marriage than those with lower levels of SES. As I stated in Chapter IV, the name "educational/economic success" is my neologism chosen to represent the collective ideas of structural assimilation and isolation theory, as well as findings from other unrelated studies. Structural assimilation theory predicts a positive relationship between SES and

intermarriage for blacks and whites, while isolation theory predicts this relationship only for blacks and assumes no association, positive or negative, for whites.

Nearly all studies garnering support for status-caste exchange theory have used complicated log-linear models of educational categories, while studies backing status homogamy theory have relied on simple tabular analyses (Rosenfeld 2005). Additionally, studies endorsing status-caste exchange have typically restricted their analyses to young married couples, while those supporting status homogamy have usually involved married couples of all ages. Rosenfeld (2005) believes that these methodological differences are largely responsible for the disparate results. Researchers who limit their analyses to young couples see evidence of status-caste exchange because a significant proportion of the couples are still in school. Since husbands are generally older than their wives, young husbands are likely to have completed more years of education than their wives. "The gender imbalance (most black-white couples have black husbands) tips the educational scales to black spouses when the interracial couples are still in school, but eventually this artifact of youth and gender disappears" (Rosenfeld 2005:1319).

Most investigations of these theories have been conducted separately, with different data sources and using different statistical approaches. Aside from Rosenfeld (2005), few social scientists have attempted to objectively examine and compare these contradictory theories of black-white intermarriage with a consistent data source and methodology. Though similar in purpose, my dissertation differs from Rosenfeld's (2005) analysis in many respects. While his study relied mainly on log-linear models of

educational categories, I used logistic regression so that I could include interval measures of economic status and educational attainment. Secondly, his analysis was based primarily on data from the 1980 census whereas mine was based entirely on data from the 2006 ACS. And finally, he focused solely on status homogamy and status-caste exchange, while I included a third prominent theory of interracial marriage—educational/economic success—in my investigation.

In my level-1 analyses, I estimated six logistic regression equations to evaluate the abovementioned micro-theories of interracial marriage. The major goal was not the development of a comprehensive model of interracial marriage. Rather, I hoped to discover which types of variables influenced the likelihood of being intermarried, which did not, and of those that did, which seemed to be the most important.

In Models 1 and 2[18], I explored the intermarriage probabilities in 2006 of 317,267 white females and 21,768 black females living in the metropolitan areas of the U.S. I assessed the degree to which two status-caste exchange theory variables, i.e. the husband/wife SEI ratio and the husband/wife education ratio, were related to the likelihood of the women being interracially married. In accordance with the expectations of status-caste exchange theory, I hypothesized that the independent variables would have a positive relationship with the log odds of intermarriage for white women and a negative relationship with the log odds of intermarriage for black women.

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[18] Models 1A and 2A were also used to evaluate status-caste exchange theory. They were included for diagnostic reasons, but the results were analogous to the results of Models 1 and 2. Please see Chapter IV for further discussion.

The results of Models 1 and 2 contradicted the claims of Davis and Merton's exchange theory. Each of the models had only one significant effect, and it was in the unpredicted direction each time. For example, according to the odds ratio data in my equations, Model 1 showed that each additional increase in the h/w SEI ratio decreases the odds of intermarriage for white women by 3.29 percent, other things equal. Alternatively, Model 2 revealed that each additional increase in the h/w education ratio increases the odds of intermarriage for black women by 8.67 percent, other things equal. Status-caste exchange theory was accorded no support from this exercise. In fact, these results defy its assumptions, implying that intermarried white women marry down in occupational status, while intermarried black women marry up in educational attainment.

Models 3 and 4 contained 278,841 white metropolitan females and 19,707 black metropolitan females, respectively. These models examined the degree to which two status homogamy theory variables, i.e. homogamy SEI and homogamy education, were associated with the likelihood of the women being intermarried. In keeping with the assumptions of status homogamy theory, I hypothesized that the independent variables would be negatively associated with the log odds of being intermarried for both white and black women.

Model 3 provided only partial support to the claims of status homogamy theory as it relates to white women. The effect of homogamy SEI on white intermarriage was negative and significant, while the effect of homogamy education was positive and significant. Model 4 had no significant effects, indicating that the theory was a poor

predictor of intermarriage for black women. In brief, these findings challenge the assumption that interracial spouses will have similar levels of SES.

Models 5 and 6 contained 317,255 white metropolitan females and 21,764 black metropolitan females, respectively. These models examined the extent to which three educational/economic success variables, i.e. wife's SEI, wife's education, and wife's income, were related to the log odds of the women being intermarried. Since educational/economic success theory contends that people with higher levels of SES will be more likely to marry interracially than people with lower levels of SES, I hypothesized that the independent variables would be positively associated with the odds of being intermarried for both white and black women.

Models 5 and 6 supported the assumptions of educational/economic success theory for both groups of women. Among white women, those with high occupational status (SEI) and high annual income were more likely to be intermarried than those with low occupational status and lower income. Among black metropolitan women, those with high occupational status and high levels of education were more likely to be intermarried than those with low occupational status and low levels of education.

In conclusion, status-caste exchange theory was accorded no support from my analyses and status homogamy theory was accorded only inconsistent support for white women. The results clearly convey that educational/economic success theory is applicable for predicting intermarriage among white and black metropolitan women in the United States. Each of the educational/economic success models (Models 5 and 6)

performed well, containing two independent variables with significant effects in the expected direction.

Retrospectively, there are some minor problems with my individual-level analyses that I will now take the time to address. The three theories I examined each offers predictions about the type of individuals who are most likely to participate in an interracial marriage. For example, status-caste exchange theory assumes that black individuals with high status should be more likely to marry women of lower class, as the marriage signifies an exchange of the man's financial resources for the woman's high racial caste position. This prediction is directed towards the characteristics of the individuals at the time of their nuptials, not over the course of their marital lifetimes. By including in my analysis all married individuals, I violated this basic assumption in each of these theories. Few individuals have exactly the same occupational status score, income, and educational attainment at the time of their wedding as they do later in their marriage. For that reason, this problem of specification may well have contributed to the insignificant and inconsistent outcomes in both the status homogamy and status-caste exchange models. My investigation would have been greatly improved had it been possible to determine when the couples were married. Although such information was not as critical here as nuptial location was to the Blau analysis, it would have certainly enhanced the integrity of my findings.

While the data from the ACS do not contain information on length of marriage or nuptial timing, this problem could have been handled by restricting my analyses to

individuals aged 20 to 29[19]. I felt this age restriction would have been too drastic, however, given the limited numbers of intermarried women of all ages in both samples. Furthermore, when I examined patterns of intermarriage for each group of women, I observed that most intermarried women were in their mid-30s, rather than their mid-20s. Looking back, I now know I should have expanded my dataset by merging two or perhaps three ACS samples. In all probability, if I had joined the 2005 and 2006 ACS samples, I may well have had an adequate number of intermarried couples to perform this age restriction without jeopardizing the variation in the dependent variable.

In terms of methodology, I was satisfied with my choice of logistic regression since it enabled me to incorporate continuous independent variables in my models. Had I opted to use log-linear modeling, I would have had to exclude income and possibly even SEI from my analyses, as these variables would have been difficult to force into categories in a statistically acceptable manner. Given the popularity of log-linear analysis for cross-tabulated marriage data (Rosenfeld 2005:1289; Botev 1994; Hout and Goldstein 1994; Kalmijn 1991a, 1991b, 1993, 1998; Pagnini and Morgan 1990; Rosenfeld 2001; Sandefur and McKinnell 1986), however, I feel it may have been advantageous to run a series of log-linear models with the 2006 ACS data. My final conclusions about the three theories would have been more convincing had I subjected them to different types of statistical tests. This will be an important next step in my research.

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[19] My analysis of white metropolitan women contained individuals aged 16 to 95, while my analysis of black metropolitan women contained individuals aged 16 to 94.

Multilevel Analyses

In Chapter V, I used hierarchical generalized linear models (HGLMs) to conduct multilevel analyses of the log odds of white and black metropolitan women being in interracial marriages. This allowed me to examine the extent to which the characteristics of the women themselves, along with the contextual characteristics of their metropolitan areas, influenced their probability of being interracially married. In the paragraphs that follow, I will review my hypotheses, discuss my results, and address the weaknesses in my investigation.

The educational/economic success variables were utilized as the level-1 variables in the two-tiered HGLMs since they had the most consistent effects on the incidence of intermarriage for both white and black women. An assortment of predictors, measuring conservative or liberal representation at the metropolitan level, were used as the level-2 variables. I treated the slopes as fixed in all of the multilevel models, mainly because my theoretical reasoning centered on the direct effects of the level-2 variables.

In Models 7 and 8, I examined the intermarriage probabilities in 2006 of 316,553 white women living in 280 metropolitan areas of the United States. Model 7 appraised the extent to which one level-1 variable, wife's SEI, and one level-2 variable, the gay household rate, were related to the likelihood of the women being interracially married. In keeping with the notions of educational/economic success theory, I hypothesized that women with a high value on occupational status (SEI) should have higher log odds of being in an interracial marriage than women with a low value on this variable. Previous research has indicated that interracial couples and same-sex couples are confronted with

similar types of discrimination that prompts them to live in liberal metropolitan areas. Thus, I hypothesized that women living in metropolitan areas with a high gay household rate should have higher log odds of being intermarried.

At the individual-level, I found that wife's SEI was positively and significantly associated with the probability of being intermarried. Among white metropolitan females, those with high SEI scores were more likely to be intermarried than those with low SEI scores. At the contextual-level, I found that the gay household rate was positively and significantly associated with the mean intermarriage rate of the metropolitan areas. The higher the gay household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among white women.

Model 8 considered the extent to which one level-1 variable, wife's SEI, and one level-2 variable, the lesbian household rate, were related to the likelihood of white women being interracially married. As explained above, wife's SEI was predicted to have a positive relationship with intermarriage, i.e., the higher a woman's value on SEI, the higher her log odds of being interracially married. Since interracial and same-sex couples tend to be drawn to the same types of environments, I predicted a positive association between the lesbian household rate and intermarriage. Specifically, I hypothesized that women residing in metropolitan areas with a high lesbian household rate should have higher log odds of being intermarried.

At the individual-level, I found that wife's SEI was positively and significantly associated with the probability of being interracially married. That is to say, white females with high SEI scores were more likely to be intermarried than those with low

SEI scores. At the contextual-level, I found that the lesbian household rate was positively and significantly associated with the mean intermarriage rate of the metropolitan areas. The higher the lesbian household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among white women.

In Models 9 and 10, I examined the intermarriage probabilities in 2006 of 21,764 black women living in 58 metropolitan areas of the United States. Model 9 explored the extent to which three level-1 variables, namely, wife's income, wife's SEI, and wife's education, and two level-2 variables, namely, percentage Republican and the gay household rate, were related to the likelihood of the women being interracially married. Educational/economic success theory predicts a positive association between socioeconomic status and intermarriage. Therefore, I hypothesized that women with high values on income, occupational status (SEI), and education should have higher log odds of being in an interracial marriage than women with low values on these variables. Previous studies have shown that Republicans and ideological conservatives tend to have more negative opinions of intermarriage than their liberal counterparts. Thus, I hypothesized that women living in metropolitan areas with a high percentage Republican should have lower log odds of being intermarried. As in the white models, the gay household rate was hypothesized to have a positive relationship with intermarriage for black women.

At the individual-level, I found that wife's income, wife's SEI, and wife's education were all positively and significantly associated with the probability of being

intermarried. That is to say, among black metropolitan females, those with high incomes, high SEI scores, and high levels of education were more likely to be intermarried than those with low values on these variables. At the contextual-level, I found that the gay household rate was positively and significantly associated with the mean intermarriage rate of the metropolitan areas. The higher the gay household rate in a metropolitan area, the higher the metropolitan area's average expected log odds of intermarriage among black women. While the percentage Republican variable was negatively related to intermarriage, its effect was not quite significant in the two-tailed t-test.

Model 10 considered the extent to which three level-1 variables, wife's income, wife's SEI, and wife's education, and two level-2 variables, the Baptist adherent rate and the gay household rate, were related to the likelihood of black women being intermarried. For reasons discussed above, all three of the level-1 educational/economic success variables were hypothesized to have a positive relationship with intermarriage. Prior research has shown that individuals with conservative religious beliefs tend to have more adverse opinions toward intermarriage than those with more moderate beliefs. Therefore, I predicted there would be a negative relationship between the Baptist adherent rate and intermarriage. Specifically, I hypothesized that women living in metropolitan areas with a high Baptist adherent rate should have lower log odds of being intermarried. As in earlier models, the gay household rate was hypothesized to have a positive association with intermarriage.

At the individual-level, I found that wife's income, wife's SEI, and wife's education were all positively and significantly related to the probability of intermarriage for black women. At the contextual-level, I found that the Baptist adherent rate was negatively and significantly associated with the mean intermarriage rate of the metropolitan areas. That is to say, the greater the Baptist adherent rate of a metropolitan area, the less the likelihood of being interracially married. As in the previous models, the gay household rate was positively and significantly associated with the mean intermarriage rate of the metropolitan areas.

In brief, my multilevel analyses showed that context matters in predicting and understanding intermarriage among white and black metropolitan women in the United States. Both the individual-level characteristics of the women, as well as the contextual-level characteristics of their metropolitan areas, were shown in my equations to impact their likelihood of being intermarried. Future research would benefit from the inclusion of social context in any consideration of intermarriage, particularly through the use of multilevel modeling, which until now, has not been utilized by researchers in this area.

As I mentioned earlier, my tests of the three micro-level theories would have benefited from a larger dataset and an age restriction to approximate nuptial timing. Fortunately, the contextual-level hypotheses driving my Chapter V multilevel analyses did not require information on when or where the couples were married. Still, for statistical reasons, my multilevel models would have profited from an expanded dataset. In utilizing only the most recent ACS sample, the variation in the white and black data was limited and caused several problems and inconsistencies in my analyses.

First, inadequate variation in the level-1 variables required that I hold the slopes as fixed in all of the multilevel models for both groups of women. When I treated the slopes as random, none of the HLGM applications for either set of data would converge. While there were no obvious theoretical motives to treat the slopes as random, I believe my analyses would have been enriched by some exploration regarding the indirect effects of context on individual behavior. For example, it would have been interesting to know whether the positive relationship between SEI and intermarriage is stronger in metropolitan areas with a high gay household rate or weaker in areas with a high Baptist adherent rate. According to Anderton and Sellers (1989:109), these cross-level interactions "seem to more nearly resemble theoretical discussions of context," which typically treat contexts as environments that house individual-level relationships. Furthermore, the capacity to examine the effects of the level-2 variables on the level-1 slopes is one of the most valuable and unique aspects of the HLGM application.

Although insufficient variation caused problems for both the white and black analyses, the problems affecting the white data were more substantial. On account of the greater variation in the black data, each multilevel equation was estimated with three level-1 variables and two level-2 variables. In contrast, the invariant white data accepted only one level-1 variable and one level-2 variable in each of the equations. When I tried to include additional level-1 and/or level-2 variables in my white analysis, the HGLMs would not converge during the iterative process. Ideally, my black and white models would have contained the same combination of independent variables to facilitate

comparisons between groups and to maintain consistency with my level-1 investigation in Chapter IV.

I now realize a larger dataset would have improved my multilevel analyses. Had I merged the 2005 and 2006 ACS samples, there may have been sufficient variation to eliminate the aforementioned problems.

Discussion and Future Research

If I were to conduct the same analyses again using data from the American Community Survey, I would certainly attempt to expand my dataset by merging several ACS samples. Rates of white-black intermarriage are still very low in our nation, which meant that very few of these couples were captured in the single 2006 ACS sample that I used. This numerical deficiency created statistical problems at various stages in my project. As I explained at some length in Chapter V, the data restrictions required for the Blau investigation depleted the black data to the point that multilevel modeling was unfeasible. While there were enough cases to conduct the analysis for white women, it was apparent that most of the models would have been inestimable owing to the inadequate variation in the white data.

The lack of interracial couples not only rendered the Blau investigation off limits, it also interfered with my two other core analyses presented in Chapters IV and V. Because the three theories guiding my individual-level analyses were directed towards individuals at the time of their nuptials, I really wanted to incorporate an age restriction to approximate nuptial timing. This restriction was decidedly too severe for implementation, however, given the limited numbers of intermarried women in both the

white and black samples. In terms of my multilevel analyses, insufficient variation in the level-1 variables required that I hold the slopes as fixed in all of the models for both black and white women. Although I had no theoretical cause to treat the slopes as random, I believe, as stated above, that an examination of cross-level interactions would have improved my overall contribution.

If I continue to use the ACS for my research, the next logical step would be to enlarge my dataset by linking several ACS samples together. I recognize, however, that this would not remove all the problems resulting from my using the ACS for my investigation. To effectively test Blau's theory and the three individual-level theories, I need information on nuptial location and timing—variables that do not exist in the ACS. As I explained in Chapter V, my approximation of nuptial location would be weak using the ACS, since the survey only contains a one-year migration variable that does not differentiate between residential mobility and true migration. Recall also that the ACS birthplace variable does not extend below the level of the state, so this additional restriction would not be that helpful for my research on metropolitan couples. Supposing I accept these assumptions and resume my research using a larger ACS dataset, I still may face barriers in successfully merging the samples. Each of the ACS samples is weighted based on a specific sampling arrangement, which has evolved over the years. For instance, the 2004 ACS sample is a 1-in-239 national random sample that does not extend below the level of the state. In contrast, the 2005 and 2006 ACS samples are 1-in-100 national random samples that extend to the level of the PUMA. While I would prefer to merge at least three ACS samples together, a continued focus on

metropolitan couples would require that I limit my dataset to the 2005 and 2006 ACS samples. It is questionable whether this augmentation would be sizeable enough to eliminate all the statistical deficiencies that burdened this project. Accordingly, it may be best to continue my research by means of an alternative secondary dataset or by collecting my own data.

If I had an unlimited amount of time and resources, I would design my own survey instrument for an exhaustive quantitative analysis of black-white intermarriage. This would enable me to include the items necessary for a more meaningful examination of Blau's theory and the three individual-level theories. This would also give me control over the coding decisions and data input, which would in turn facilitate my subsequent statistical analyses. In the ACS dataset, for example, there is no clear distinction between codes of zero which may represent either missing data or instances of unemployment. Such confusion is naturally avoided with primary data. Ideally, the survey would be administered in a face-to-face interview since this form of collection lends itself to higher response rates (Garson 2008). An interview format would also promote the inclusion of open-ended questions, which may be valuable given the complexity of my research topic.

Increasingly, demographers are combining their traditional quantitative approaches with qualitative methods (Randall and Koppenhaver 2004). The impetus for this new direction is to improve our understanding of "why" people behave the way they do and how they rationalize their behavior. According to John Knodel and colleagues (1987:22), "both types of data are useful, can complement each other, and when

integrated into a single analysis, can provide a more complete picture than if each were analyzed separately." I believe a mixed-methods approach would be invaluable to my research on interracial marriage, not only to become acquainted with the couples that motivate my work, but also to aid in the development of my survey instrument and research hypotheses. To complement the work presented in this dissertation, I plan to conduct in-depth interviews with approximately 30 intermarried black-white couples. I am optimistic these discussions will shed light on their union formations, as well as their subsequent relationships with community and family. At a later date, I hope to conduct focus group discussions, which tend to elicit insights and opinions that are often unattainable through the individual interview.

My future research will expand upon my dissertation in various ways. Once the data become available, I plan to perform an analogous study of rural black-white couples. Past studies have shown that rural residents tend to hold more objectionable views of interracial marriage than urban residents, especially in the South (Romano 2003; Golebiowska 2007). They are also inclined to have a more conservative perspective on other issues besides interracial unions, such as same-sex marriage (Glenn and Hill 1977; Larson 1978). In respect to my quantitative analysis, I am interested in observing how the three micro-level theories perform on rural women given that money and status seem to have less of an impact on their marital decisions (Hansen 1987; cited by Cready and Saenz 1997). I am also interested in the relevance of context for intermarriage in rural America. Do prevailing political and religious affiliations have more influence on marital outcomes in rural areas where such groups have more power?

Do towns with greater racial/ethnic heterogeneity have higher rates of interracial marriage? How do levels of racial integration within residential, educational, and religious settings impact the log odds of interracial marriage in rural versus urban areas? By way of interview and focus group discussion, I also hope to learn more about the kinds of barriers interracial couples face in each of these settings.

According to Fu (2000), interracial marriages are 24 percent more likely to end in divorce than intraracial marriages (cited by Wang et al. 2004). The instability of these marriages is largely linked to the surrounding social pressures of family and friends, who often oppose and openly object to such unions (Lewis et al. 1997; Harris and Kalbfleisch 2000). In fact, parental objection has been cited as the main obstacle for establishing and sustaining interracial romantic relationships (Mok 1999; Wang et al. 2004). Wang et al. (2004:18) found that similar barriers impede the interracial relationships of adolescents. Even after controlling for various demographic and relationship factors, adolescents who participated in interracial romantic relationships were found to be more likely to terminate their relationship than those who were involved in intraracial relationships. Fortunately, Rosenfeld's (2007) analysis on the independent life stage suggests that interracial and other nontraditional couples are encountering less resistance everyday, even in the form of parental control. As the unions are becoming more visible nationwide, people are becoming more tolerant. In the private realm, parents and siblings who were once condemnatory often become more accepting of the relationship once the grandchildren are born.

Eventually, I would like to expand on the existing literature by employing a longitudinal research design to explore the stability of black-white marriages over time. Subjects would be followed through the first 10 years of their first marriage, and detailed data would be collected at 1 year, 5 year, and 10 year intervals. This project would be guided by a wide assortment of research questions. Are there indeed structural barriers (i.e. parental objections, societal prejudices) that make these marriages harder to maintain? Do these couples enter marriage with less orthodox perspectives that make them more accepting of divorce? Does residential location in a less progressive region/city contribute to the hazard of getting divorced? Do socioeconomic factors play a role? What variables are significant among those who survive the hazard of divorce? As our society continues to grow more accepting of nontraditional unions, does it "get easier" to be an interracial couple in America (i.e. in 10 years versus 1 year)? At what speed is that transition occurring? Who/what do the subjects see as the most salient mediums of change (e.g. laws, movements, mainstream media, political figures, celebrities)?

"Among all types of intermarriage in the United States, black-white intermarriage is the most important because the black-white division is the deepest and most enduring division in U.S. society" (Rosenfeld 2005:1290; Massey and Denton 1993; Lieberson and Waters 1988; Myrdal, Sterner, and Rose 1944; White 1988). For this reason, my research agenda centers primarily on this group. At some point in the future, however, I would like to extend my dissertation and other proposed studies with data on other types of interracial/interethnic unions in our nation (e.g. white-Asian,

white-Hispanic, black-Hispanic, black-Asian, Hispanic-Asian). Marriage is relatively

common between some of these groups, which would make my analyses easier to

conduct and may well result in more conclusive findings. Such studies would hopefully

help to legitimize the black-white findings, and possibly even lead to the development of

comprehensive theories.

Conclusion

For most of our nation's history, interracial relationships have been targeted with

extreme hostility and derision. In fact, antimiscegenation laws existed in most U.S.

states until 1967, when the landmark *Loving v. Virginia* Supreme Court decision ruled

all such statutes unconstitutional. Since that ruling, the number of black-white marriages

increased significantly from 65,000 in 1970 to 422,000 in 2005, as indicated by U.S.

Census Bureau statistics (see also Crary 2007). Taking into account all racial

combinations, Rosenfeld estimates that over 7 percent of America's 59 million married

couples in 2005 were interracial, compared to less than 2 percent in 1970 (Crary

2007:1).

Consistent immigration from a diverse array of countries and cultures around the

globe, along with the increasing rate of interracial marriage, are already shaping this

country's future into a more diverse and tolerant society. These trends are being

spearheaded by the younger generations, and as families combine, cultures combine as

well. As older generations ultimately disappear, resistance will likely diminish with the

demise of old social guidelines. Interracial marriage is on the increase for all groups, yet

black-white marriages lag behind in momentum. Family building is the ultimate

indicator of social acceptance, making these unions an important measure of race

relations and collective progress. Continued research is important for the development

of a broader understanding of this phenomenon and its implications for American

society.

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